



CARLO GAVAZZI SPACE SpA

## AMS02-PDS

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## **REGISTRAZIONE DELLE MODIFICHE / CHANGE RECORD**

| <b>EDIZIONE<br/>ISSUE</b> | <b>DATA<br/>DATE</b> | <b>AUTORIZZAZIONE<br/>CHANGE AUTHORITY</b> | <b>OGGETTO DELLA MODIFICA E SEZIONI AFFETTE<br/>REASON FOR CHANGE AND Affected SECTIONS</b> |
|---------------------------|----------------------|--|---|
| 1                         | 27/06/2009           | -  | First Issue   |
|                           |                      |  |   |

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## 1 SCOPE

This document describes the report of functional and electrical tests of the:

**AMS02-PDS**

Model: **PFM**

Part number: **10-AMS02PDS-000.00**

Serial number: **FM01**

The document corresponds to contract deliverable DEL 100

## 2 DOCUMENTS

### 2.1 APPLICABLE DOCUMENTS

| AD | Doc. Number    | Issue / Date   | Rev  | Title / Applicability                                      | Remarks |
|----|----------------|----------------|------|--|---------|
| 1  | AMS-RQ-CGS-002 | 1 / April 2007 | N.A. | <i>PDS Specification</i>                                   |         |
| 2  | PDS-PL-CGS-003 | 1 / 11-05-2009 | N.A. | <i>AMS02 PDS DESIGN DEVELOPMENT AND QUALIFICATION PLAN</i> |         |

### 2.2 REFERENCE DOCUMENTS

| RD | Doc. Number        | Issue / Date   | Rev  | Title / Applicability                                      | Remarks |
|----|--------------------|----------------|------|--|---------|
| 1  | 10-AMS02PDS-000.00 | 28/07/2008     | /    | <i>AMS02 Power Distribution System Assembly</i>            |         |
| 2  | 10-AMS02PDS-000.01 | 28/07/2008     | /    | <i>AMS02 Power Distribution System Assembly Parts List</i> |         |
| 3  | 10-AMS02PDS-000.02 | 08/06/2009     | A    | <i>AMS02 Power Distribution System ICD</i>                 |         |
| 4  | PDS-IC-CGS-001     | 2 / 08-06-2009 | N.A. | <i>PDS FM electrical/functional, mechanical ICD</i>        |         |

## 3 ACRONYMS

|      |   |
|------|---|
| C.I. | Configuration Item. Also called Part Number (P/N) |
| CGS  | Carlo Gavazzi Space                               |
| FM   | Flight Model                                      |
| NA   | Not Applicable                                    |
| P/N  | Part Number. Also called Configuration Item C.I.  |
| PA   | Product Assurance                                 |
| PDS  | Power Distribution System                         |
| PVS  | Procedure Variation Sheet                         |
| QA   | Quality Assurance                                 |
| S/N  | Serial Number                                     |
| TE   | Test Equipment                                    |
| UUT  | Unit Under Test                                   |

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## 4 PARTICIPANTS REQUIRED

### 4.1 GENERAL

All test will be performed under QA surveillance in accordance with, and following detailed procedure of applicable PA Plan.

### 4.2 RESPONSIBILITY

The technical responsibility for testing and test results is up to the Engineering department.

QA is responsible for ensuring that all the agreed procedures are carefully observed, that test equipment and instrumentation used during testing is calibrated and within validity date: that the test data sheets are recorded in the Test Report and signed by the operators and QA witnesses, that all non conforming condition and test results are properly documented and notified to the Prime Contractor, and that all requirements of applicable PA Plan, specification and Statement of Work pertaining to the acceptance tests, are fully satisfied.

### 4.3 QA WITNESS OF TEST AND SIGN-OFF

QA inspector, or its delegate, shall witness the tests described in this procedure in accordance to the requirement specified in the applicable PA Plans.

### 4.4 NON CONFORMANCE AND FAILURES

Any malfunction/defect which occurs during the test will be processed along the Non Conformance Procedure described in the applicable PA Plans.

### 4.5 CALIBRATION REQUIREMENTS

All instruments used for testing shall be calibrated.

Evidence of certification shall be provided by a label attached to the instruments itself, showing the calibration date, the expiring date and the signature of the operator.

## 5 TEST ARTICLE

The test article consists of: (see Par. 1).

Before starting the test, the model, P/N and SN of the test article to be tested shall be recorded on the step-by-step procedure sheets under the table cell "UNIT UNDER TEST".

## 6 TEST CONFIGURATION

Before the beginning of the test, be sure that all the cables between AMS02-PDS box and test setup are connected.

Follows a list of the needed instruments:

- 1 oscilloscope: it is recommended to connect the oscilloscope to PC in order to acquire the measurements (acquisition software required)
- 2 multimeters

|  |   |  |
|--|---|--|
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- 1 short circuit generator
- 1 current probe to connect to oscilloscope
- EPP can box (interface between PC and PDS)
- 1 milliohmmeter
- 1 personal computer with LINUX operative system
- Test racks

The needed interface software is the following:

- PDS-4
- USCM

During test, it's suggested the use of a fan applied to PDS dissipator.  
The accuracy of the telemetry are resumed in the following table

|             | Signals                            | Monitored Range | Accuracy                              |
|-------------|------------------------------------|-----------------|---------------------------------------|
| Input Stage | Main Power Voltage                 | 0V + 190V       | 5%                                    |
|             | Main Power Current                 | -5A + 33A       | 20% F.S.<br>see<br>RFW PDS-WV-CGS-002 |
|             | Analog Reference Voltage           | ~4V             | ±250mV                                |
| ESEM1-A     | Main Power Voltage                 | 0V + 150V       | 3%                                    |
|             | Temperature                        | -40°C + +90°C   | ±2°C                                  |
|             | +28V Output Voltage                | 0V + 36.76V     | 3%                                    |
| PB2         | Analog Reference Voltage           | ~2V             | ±250mV                                |
|             | Temperature                        | -40°C + +90°C   | ±2°C                                  |
|             | Outlet #1 to #7 Current (rated 5A) | 0A + 7.5A       | 3%                                    |
| Esem3-A     | Outlet #8 Current (rated 10A)      | 0A + 15A        | 3%                                    |
|             | Analog Reference Voltage           | ~3V             | ±250mV                                |
|             | Temperature                        | -40°C + +90°C   | ±2°C                                  |
| ESEM3-B     | Outlet #12 Current (rated 10A)     | 0A + 15A        | 3%                                    |
|             | Analog Reference Voltage           | ~2.5V           | ±250mV                                |
|             | Temperature                        | -40°C + +90°C   | ±2°C                                  |

Tab. 1: Accuracy value

The position of each board inside the PDS is depicted in the next picture.

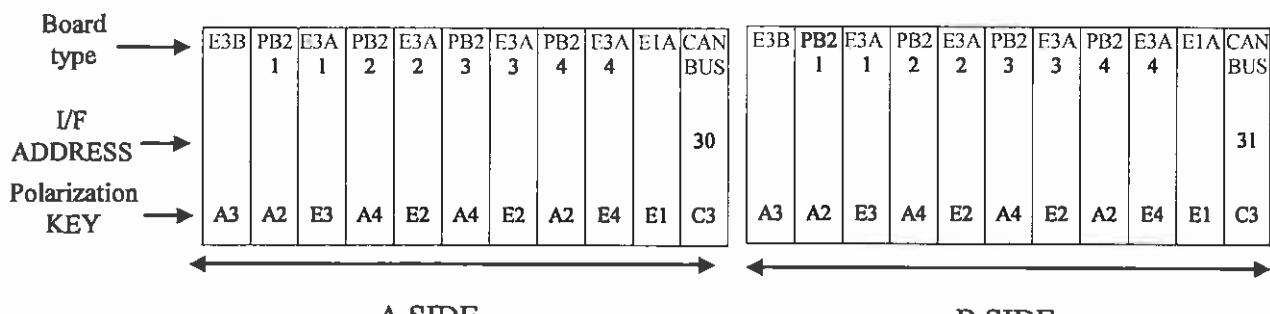


Figura 1: Boards order (view from front panel)

|  |   |  |
|--|---|--|
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## 6.1 REQUIREMENTS CROSS REFERENCE

Cross reference among requirements and procedure steps is provided next table:

| Requirement (see AD1)                              | Section   |
|--|---|
| 3.2.1.7<br>Pds Dissipated Power Budget             | 10.3.1.8 , 10.3.2.8   |
| 3.2.1.8<br>Power-Up                                | 10.3.1.2, 10.3.1.3 ,10.3.1.4,<br>10.3.2.2, 10.3.2.3, 10.3.2.4   |
| 3.2.1.9<br>PDS REDUNCANCY                          | 10.3.1, 10.3.2, 10.3.3  |
| 3.2.1.10<br>PDS electrical reduncancy performance  | 10.3.3  |
| 3.2.1.11.1<br>120Vdc to CCS/CAB                    | 10.3.1.5.11, 10.3.2.5.11  |
| 3.2.1.13<br>PDS signal and power interfaces        | 10.3.1.5, 10.3.2.5  |
| 3.2.1.14.2<br>Trip Coordination                    | 10.3.1.5.4, 10.3.1.5.6,<br>10.3.1.5.8, 10.3.1.5.10,<br>10.3.1.5.11, 10.3.2.5.4,<br>10.3.2.5.6, 10.3.2.5.8,<br>10.3.2.5.10, 10.3.2.5.11  |
| 3.2.1.14.4<br>On Board Measurements                | 10.3.1.6 , 10.3.2.6   |
| 3.2.2.3.1<br>PDS current monitor accuracy          | 10.3.1.6.2 , 10.3.2.6.2   |
| 3.2.2.3.2<br>PDS voltage monitor accuracy          | 10.3.1.6.3 , 10.3.2.6.3   |
| 3.2.3.1<br>PDS 28V OUTPUT general                  | 10.3.1.5.4, 10.3.1.5.6,<br>10.3.1.5.8, 10.3.1.5.10,<br>10.3.2.5.4, 10.3.2.5.6,<br>10.3.2.5.8, 10.3.2.5.10   |
| 3.2.3.2<br>PDS 28V output characteristics          | 10.3.1.5.3, 10.3.1.5.4,<br>10.3.1.5.5, 10.3.1.5.6,<br>10.3.1.5.7, 10.3.1.5.8,<br>10.3.1.5.9, 10.3.1.5.10,<br>10.3.2.5.3, 10.3.2.5.4,<br>10.3.2.5.5, 10.3.2.5.6,<br>10.3.2.5.7, 10.3.2.5.8,<br>10.3.2.5.9, 10.3.2.5.10 |
| 3.2.3.6<br>PDS 28V outlet current ratings          | 10.3.1.5.4, 10.3.1.5.6,<br>10.3.1.5.8, 10.3.1.5.10,<br>10.3.2.5.4, 10.3.2.5.6,<br>10.3.2.5.8, 10.3.2.5.10   |
| 3.2.3.7<br>PDS 28V outlet current monitor          | 10.3.1.6 , 10.3.2.6   |
| 3.2.3.8<br>PDS 28V outlet over current protections | 10.3.1.5.4, 10.3.1.5.6,<br>10.3.1.5.8, 10.3.1.5.10,<br>10.3.2.5.4, 10.3.2.5.6,<br>10.3.2.5.8, 10.3.2.5.10   |
| 3.2.4.4<br>PDS 120V outlet current monitor         | 10.3.1.5.11, 10.3.2.5.11  |
| 3.2.4.5<br>PDS 120V outlet output protection       | 10.3.1.5.11, 10.3.2.5.11  |
| 3.2.4.6<br>CCEB OUTLET current limiter and         | 10.3.1.5.11, 10.3.2.5.11  |



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|  |   |
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| over-current protection  |   |
| 3.2.4.7<br>PDS CCEB OUTLET current monitor                           | 10.3.1.6 , 10.3.2.6   |
| 3.2.5.4<br>Pds Interface with AMS (Can Bus Interface) Analog Input   | 10.3.1.6 , 10.3.2.6   |
| 3.2.5.5<br>Redundancy  | 10.3.1, 10.3.2  |
| 3.2.6<br>Pds Control Logic   | 10.3.1.2.3, 10.3.1.2.4, 10.3.1.5,<br>10.3.2.2.3, 10.3.2.2.4, 10.3.2.5,<br>10.3.1.5.3, 10.3.1.5.5,<br>10.3.1.5.7, 10.3.1.5.9,<br>10.3.2.5.3, 10.3.2.5.5,<br>10.3.2.5.7, 10.3.2.5.9 |
| 3.2.6.1<br>Global Switch Off Capability                              | 10.3.1.5.2.3, 10.3.2.5.2.3  |
| 3.2.7.3<br>Temperature Sensors Acquired Internally of PDS            | 10.3.1.5, 10.3.2.5  |
| 4.1.4.1<br>steady state voltage range (nominal operations)           | 10.3.1.8 , 10.3.2.8   |
| 4.1.5.1<br>28-VDC Steady-State Voltage Range                         | 10.3.1.5.4, 10.3.1.5.6,<br>10.3.1.5.8, 10.3.1.5.10,<br>10.3.2.5.4, 10.3.2.5.6,<br>10.3.2.5.8, 10.3.2.5.10   |
| 4.1.5.2<br>28-VDC Output Power                                       | 10.3.1.8 , 10.3.2.8   |
| 4.1.5.6<br>Transients Output Voltages on Outlets Protection Tripping | 10.3.1.5.4, 10.3.1.5.6,<br>10.3.1.5.8, 10.3.1.5.10,<br>10.3.2.5.4, 10.3.2.5.6,<br>10.3.2.5.8, 10.3.2.5.10   |
| 4.1.5.10<br>Power output protection status monitoring                | 10.3.1.5.3, 10.3.1.5.5,<br>10.3.1.5.7, 10.3.1.5.9,<br>10.3.2.5.3, 10.3.2.5.5,<br>10.3.2.5.7, 10.3.2.5.9   |
| 4.1.5.11<br>Power output switching commanding                        | 10.3.1.5.4, 10.3.1.5.6,<br>10.3.1.5.8, 10.3.1.5.10,<br>10.3.2.5.4, 10.3.2.5.6,<br>10.3.2.5.8, 10.3.2.5.10   |
| 4.1.5.12<br>Power output switching status monitoring                 | 10.3.1.5.4, 10.3.1.5.6,<br>10.3.1.5.8, 10.3.1.5.10,<br>10.3.2.5.4, 10.3.2.5.6,<br>10.3.2.5.8, 10.3.2.5.10   |
| 4.1.5.13<br>Power output reset                                       | 10.3.1.5.4, 10.3.1.5.6,<br>10.3.1.5.8, 10.3.1.5.10,<br>10.3.2.5.4, 10.3.2.5.6,<br>10.3.2.5.8, 10.3.2.5.10   |
| 4.1.6.1<br>120-VDC Output Power                                      | 10.3.1.5.11, 10.3.2.5.11  |
| 4.1.6.2<br>120-Vdc Output Current Rating                             | 10.3.1.5.11, 10.3.2.5.11  |
| 4.1.6.3<br>Power output protection status monitoring                 | 10.3.1.5.11, 10.3.2.5.11  |
| 4.1.6.4<br>Power output switching commanding                         | 10.3.1.5.11, 10.3.2.5.11  |



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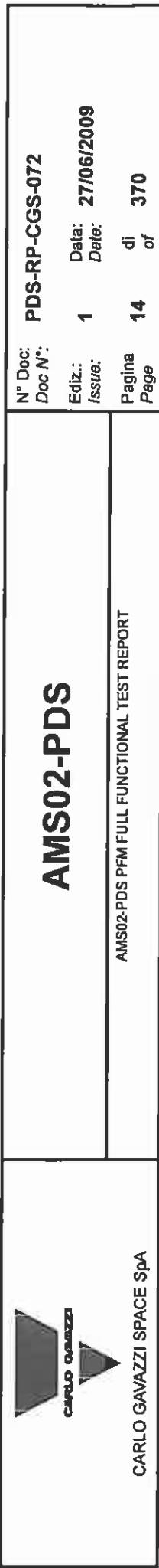
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| 4.1.6.5<br>Power output switching status monitoring | 10.3.1.5.11, 10.3.2.5.11 |
| 4.1.6.6<br>CCEB Power output reset                  | 10.3.1.5.11, 10.3.2.5.11 |
| 5.5.2.1.1<br>Primary Power Isolation                | 10.2                     |
| 5.5.2.1.2<br>Primary power to secondary isolation   | 10.2                     |
| 5.5.2.1.3<br>Secondary power grounding              | 10.2                     |
| 5.5.2.2.1<br>Bonding Requirements                   | 10.2                     |

Tab. 2: Requirements cross reference



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## 7 INSTRUMENTATION AND TEST EQUIPMENT

The complete list of the instrumentation used during the test shall be recorded in next table.

The list shall be filled up during tests and reported in Test Report.

| N. | EQUIPMENT               | MANUFACTURER | P/N              | S/N           | ACCURACY (") | NEXT CAL. DATE | REMARKS |
|----|-------------------------|--------------|------------------|---------------|--------------|----------------|---------|
| 1  | Oscilloscope            | LeCroy       | Wave Runner 6000 | ENG-LAB-204   |              | 24-may-2010    |         |
| 2  | Multimeter              | HP           | 34401            | ENG-LAB-301   |              | Nov-2009       |         |
| 3  | Multimeter              | Fluke        | 45               | ENG-LAB-104   |              | 23-may-2010    |         |
| 4  | Multimeter              | Fluke        | 45               | ENG-LAB-103   |              | 23-may-2010    |         |
| 5  | Current probe amplifier | Tektronix    | TCPA300          | ENG-LAB-300   |              | 25-may-2010    |         |
| 6  | Current probe           | Tektronix    | TCP305           | ENG-LAB-300-1 |              | 25-may-2010    |         |

Tab. 3: INSTRUMENT LIST

(\*) Where not specified the accuracy is as stated on the instrument manufacturer data sheet

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## **8 TEST CONDITION**

- The CI shall be tested in its defined configuration: it shall properly closed, all electrical loads shall be present and the CI interface function(s) shall be simulated.
- Unless otherwise specified, all measurements are to be performed at the following ambient condition:

|                   |                          |
|-------------------|--------------------------|
| Temperature       | 25 °C +/- 3°C            |
| Relative humidity | between 30 % and 60 % RH |
| Pressure          | Ambient                  |
| Cleanliness       | 100000 class             |

- All tests, unless otherwise specified, shall be performed internally to CGS laboratories in a proper area. General disposition shall be applied to maximize personnel safety from potential hazards
- Connectors savers shall be used on PFM model as applicable to protect the UUT interface connectors.
- Skilled personnel shall be employed
- All used instruments shall meet the necessary accuracy and shall not degrade the UUT performances.

## **9 TEST PROCEDURE VARIATION SHEET**

In case that for any reason the test procedure has to be changed, the change shall be described in a Procedure Variation Sheet (PVS) as shown in the next page.

The PVS shall contain:

- Reference to the test procedure to be changed
- Reference to the relevant test, procedure page and paragraph
- Description of the change, possibly in the form was....is.....
- Reason for change
- Test Engineer, QA, Test conductor signatures and dates
- Customer signature and date (when required).

Each PVS shall be identified by a reference number provided in sequential order.

All the generated PVS shall be collected in a dedicated section of the Test Report.



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## PROCEDURE VARIATION SHEET ref. N°:

|                      |               |                    |
|----------------------|---------------|--------------------|
| Test Procedure Ref.: | Page Revised: | Paragraph Revised: |
|----------------------|---------------|--------------------|

Description of Change:

Reason for Change:

## CONCURRENCE

|            |      |             |  |          |
|------------|------|-------------|--|----------|
| Test Cond. | QA   | System Eng. |  | Customer |
| Date       | Date | Date        |  | Date     |



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## 10 TEST DATA SHEETS

The step-by-step procedure sheets are provided in the following pages.

### 10.1 DATA SHEETS FILLING UP

The following fields of the data sheets:

- UUT DATA (including Model, Item, C.I., S/N)
- Measured value

shall be filled up during the test performances and shall be part of the Test Report together with photographs, sketches, etc. eventually useful to document the test execution/result.

Remarks field shall be used as a minimum to provide, where appropriate, reference to NCRs and PVS.

Test Report reference data shall be added in the relevant field.

Each data sheet (including the attachments) shall be certified by QA stamp and signature together with the Test Conductor signature and date.

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|--|--|-------------------|------|---|--|---|---|
| UUT DATA :                                   | Model  | PFM               | Item | AMMS02 POWER DISTRIBUTION SYSTEM  | C.I.   | PDS 18  | SIN<br>FM01   |
| STEP n°                                      | TEST SEQUENCE  |                   |      |   | EXPECTED<br>VALUE  | MEASURED<br>VALUE   | REMARKS   |
| 2.1  | Objective of this test is to verify the single point ground of the secondary power outputs   |                   |      |   | OK   | OK  | This test will be conducted at open box level.<br>Boards are initially not inserted   |
| 2.2  | The unit harness section shall be accessible   |                   |      |   | OK   | OK  |   |
| 2.3  | Disconnect the internal bonding cable from the bonding screw side (see picture on next page) |                   |      |   | OK   | OK  |   |
| 2.4  | Disconnect all the PCU connectors from the TE  |                   |      |   | OK   | OK  |   |
| 2.5  | Disconnect the external bonding connection   |                   |      |   | OK   | OK  |   |
| 2.6  | Measure the DC resistance between bus A positive line and:                                   |                   |      | CN 1 pin 64 or 66 motherboard S/N 01<br>CN3 pin 64 or 66 motherboard S/N 01<br>CN5 pin 64 or 66 motherboard S/N 01<br>CN7 pin 64 or 66 motherboard S/N 01<br>CN1 pin 64 or 66 motherboard S/N 02<br>CN3 pin 64 or 66 motherboard S/N 02<br>CN5 pin 64 or 66 motherboard S/N 02<br>CN7 pin 64 or 66 motherboard S/N 02                 | > 1 MΩ<br>> 1 MΩ     | OK  | Connectors located on motherboards.<br>These measurements are used to verify the isolation between 120V input bus and secondary +28V bus. |
| 2.7  | Measure the DC resistance between bus A positive line and:                                   |                   |      | CN 1 pin 112 or 114 motherboard S/N 01<br>CN3 pin 112 or 114 motherboard S/N 01<br>CN5 pin 112 or 114 motherboard S/N 01<br>CN7 pin 112 or 114 motherboard S/N 01<br>CN1 pin 112 or 114 motherboard S/N 02<br>CN3 pin 112 or 114 motherboard S/N 02<br>CN5 pin 112 or 114 motherboard S/N 02<br>CN7 pin 112 or 114 motherboard S/N 02 | > 1 MΩ<br>> 1 MΩ     | OK  | NOTE: Test performed during OPEN BOX test   |
| 2.8  | Measure the DC resistance between bus A return line and:                                     |                   |      | CN 1 pin 64 or 66 motherboard S/N 01<br>CN3 pin 64 or 66 motherboard S/N 01<br>CN5 pin 64 or 66 motherboard S/N 01<br>CN7 pin 64 or 66 motherboard S/N 01<br>CN1 pin 64 or 66 motherboard S/N 02<br>CN3 pin 64 or 66 motherboard S/N 02<br>CN5 pin 64 or 66 motherboard S/N 02  | > 1 MΩ<br>> 1 MΩ<br>> 1 MΩ<br>> 1 MΩ<br>> 1 MΩ<br>> 1 MΩ<br>> 1 MΩ               | OK  | NOTE: Test performed during OPEN BOX test   |
| DATE: 10.06.09 TEST CONDUCTOR <i>GG 2010</i> |  | QA <i>✓</i>       |      | CUSTOMER <i>✓</i>   |  |   |   |

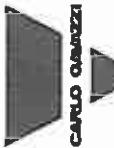
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| UUT DATA :              | Model  | PFM                                       | Item   | TEST SEQUENCE                          |  | TEST PROCEDURE REFERENCE                                 |  |
| STEP n°                 | TEST SEQUENCE  | C.I.                                      | PDS 18 | S/N                                    | FM01   | S/N  | FM01   |
| 2.9                     | CN7 pin 64 or 66 motherboard S/N 02                        |   |        | > 1 MΩ                                 |  |  |  |
|                         | Measure the DC resistance between bus A return line and:   |   |        | > 1 MΩ                                 |  |  |  |
|                         | CN 1 pin 112 or 114 motherboard S/N 01                     |   |        | > 1 MΩ                                 |  |  |  |
|                         | CN3 pin 112 or 114 motherboard S/N 01                      |   |        | > 1 MΩ                                 |  |  |  |
|                         | CN5 pin 112 or 114 motherboard S/N 01                      |   |        | > 1 MΩ                                 |  |  |  |
|                         | CN7 pin 112 or 114 motherboard S/N 01                      |   |        | > 1 MΩ                                 |  |  |  |
|                         | CN1 pin 112 or 114 motherboard S/N 02                      |   |        | > 1 MΩ                                 |  |  |  |
|                         | CN3 pin 112 or 114 motherboard S/N 02                      |   |        | > 1 MΩ                                 |  |  |  |
|                         | CN5 pin 112 or 114 motherboard S/N 02                      |   |        | > 1 MΩ                                 |  |  |  |
|                         | CN7 pin 112 or 114 motherboard S/N 02                      |   |        | > 1 MΩ                                 |  |  |  |
| 2.10                    | Measure the DC resistance between bus B positive line and: |   |        | > 1 MΩ                                 |  |  |  |
|                         | CN 1 pin 64 or 66 motherboard S/N 01                       |   |        | > 1 MΩ                                 |  |  |  |
|                         | CN3 pin 64 or 66 motherboard S/N 01                        |   |        | > 1 MΩ                                 |  |  |  |
|                         | CN5 pin 64 or 66 motherboard S/N 01                        |   |        | > 1 MΩ                                 |  |  |  |
|                         | CN7 pin 64 or 66 motherboard S/N 01                        |   |        | > 1 MΩ                                 |  |  |  |
|                         | CN1 pin 64 or 66 motherboard S/N 02                        |   |        | > 1 MΩ                                 |  |  |  |
|                         | CN3 pin 64 or 66 motherboard S/N 02                        |   |        | > 1 MΩ                                 |  |  |  |
|                         | CN5 pin 64 or 66 motherboard S/N 02                        |   |        | > 1 MΩ                                 |  |  |  |
|                         | CN7 pin 64 or 66 motherboard S/N 02                        |   |        | > 1 MΩ                                 |  |  |  |
| 2.11                    | Measure the DC resistance between bus B positive line and: |   |        | > 1 MΩ                                 |  |  |  |
|                         | CN 1 pin 112 or 114 motherboard S/N 01                     |   |        | > 1 MΩ                                 |  |  |  |
|                         | CN3 pin 112 or 114 motherboard S/N 01                      |   |        | > 1 MΩ                                 |  |  |  |
|                         | CN5 pin 112 or 114 motherboard S/N 01                      |   |        | > 1 MΩ                                 |  |  |  |
|                         | CN7 pin 112 or 114 motherboard S/N 01                      |   |        | > 1 MΩ                                 |  |  |  |
|                         | CN1 pin 112 or 114 motherboard S/N 02                      |   |        | > 1 MΩ                                 |  |  |  |
|                         | CN3 pin 112 or 114 motherboard S/N 02                      |   |        | > 1 MΩ                                 |  |  |  |
|                         | CN5 pin 112 or 114 motherboard S/N 02                      |   |        | > 1 MΩ                                 |  |  |  |
|                         | CN7 pin 112 or 114 motherboard S/N 02                      |   |        | > 1 MΩ                                 |  |  |  |
| 2.12                    | Measure the DC resistance between bus B return line and:   |   |        | > 1 MΩ                                 |  |  |  |
|                         | CN 1 pin 64 or 66 motherboard S/N 01                       |   |        | > 1 MΩ                                 |  |  |  |
|                         | CN3 pin 64 or 66 motherboard S/N 01                        |   |        | > 1 MΩ                                 |  |  |  |
|                         | CN5 pin 64 or 66 motherboard S/N 01                        |   |        | > 1 MΩ                                 |  |  |  |
|                         | CN7 pin 64 or 66 motherboard S/N 01                        |   |        | > 1 MΩ                                 |  |  |  |
|                         | CN1 pin 64 or 66 motherboard S/N 02                        |   |        | > 1 MΩ                                 |  |  |  |
|                         | CN3 pin 64 or 66 motherboard S/N 02                        |   |        | > 1 MΩ                                 |  |  |  |
|                         | CN5 pin 64 or 66 motherboard S/N 02                        |   |        | > 1 MΩ                                 |  |  |  |
|                         | CN7 pin 64 or 66 motherboard S/N 02                        |   |        | > 1 MΩ                                 |  |  |  |
| 2.13                    | Measure the DC resistance between bus B return line and:   |   |        | > 1 MΩ                                 |  |  |  |
|                         | CN 1 pin 112 or 114 motherboard S/N 01                     |   |        | > 1 MΩ                                 |  |  |  |
|                         | CN3 pin 112 or 114 motherboard S/N 01                      |   |        | > 1 MΩ                                 |  |  |  |
|                         | CN5 pin 112 or 114 motherboard S/N 01                      |   |        | > 1 MΩ                                 |  |  |  |
|                         | CN7 pin 112 or 114 motherboard S/N 01                      |   |        | > 1 MΩ                                 |  |  |  |
|                         | CN1 pin 112 or 114 motherboard S/N 02                      |   |        | > 1 MΩ                                 |  |  |  |
|                         | CN3 pin 112 or 114 motherboard S/N 02                      |   |        | > 1 MΩ                                 |  |  |  |
|                         | CN5 pin 112 or 114 motherboard S/N 02                      |   |        | > 1 MΩ                                 |  |  |  |
|                         | CN7 pin 112 or 114 motherboard S/N 02                      |   |        | > 1 MΩ                                 |  |  |  |

DATE: 10.06.01 TEST CONDUCTOR *F. Zio .3* QA *F. Zio .3*

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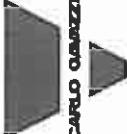


AMS02-PDs

CARLO GAVAZZI SPACE SpA

AMS02-PDS PFM FULL FUNCTIONAL TEST REPORT

| CARLO GAVAZZI |  | <b>AMSS02-PDS</b>                         |        | N° Doc:<br>Doc N°:<br>Ediz.:<br>Issue:<br>Pagina<br>Page |                                 | PDS-PR-CGS-006<br>2<br>Data:<br>Date:<br>20<br>di<br>of<br>370 |        | N° Doc:<br>Doc N°:<br>Ediz.:<br>Issue:<br>Pagina<br>Page |                   | PDS-RP-CGS-072<br>1<br>Data:<br>Date:<br>20<br>di<br>of<br>370 |   |  |  |
|---------------|--|---|--------|--|---------------------------------|--|--------|--|-------------------|--|---|--|--|
|               |  | AMS02-PDS PFM FULL FUNCTIONAL TEST REPORT |        | TEST PROCEDURE REFERENCE                                 |                                 |  |        |  |                   | TEST REPORT REFERENCE  |   |  |  |
| UUT DATA :    |  | Model                                     | PFM    | Item   | AMS02 POWER DISTRIBUTION SYSTEM | C.I.   | PDS 1B | S/N  | FMS1              |  |   |  |  |
| STEP n°       | TEST SEQUENCE  |   |        |  |                                 |  |        | EXPECTED<br>VALUE  | MEASURED<br>VALUE | REMARKS  |   |  |  |
| 2.14          | CN3 pin 112 or 114   | motherboard                               | S/N 01 |  |                                 |  |        | > 1 MΩ   |                   |  |   |  |  |
|               | CN5 pin 112 or 114   | motherboard                               | S/N 01 |  |                                 |  |        | > 1 MΩ   |                   |  |   |  |  |
|               | CN7 pin 112 or 114   | motherboard                               | S/N 01 |  |                                 |  |        | > 1 MΩ   |                   |  |   |  |  |
|               | CN1 pin 112 or 114   | motherboard                               | S/N 02 |  |                                 |  |        | > 1 MΩ   |                   |  |   |  |  |
|               | CN3 pin 112 or 114   | motherboard                               | S/N 02 |  |                                 |  |        | > 1 MΩ   |                   |  |   |  |  |
|               | CN5 pin 112 or 114   | motherboard                               | S/N 02 |  |                                 |  |        | > 1 MΩ   |                   |  |   |  |  |
|               | CN7 pin 112 or 114   | motherboard                               | S/N 02 |  |                                 |  |        | > 1 MΩ   |                   |  |   |  |  |
| 2.14          | All boards modules must be inserted  |   |        |  |                                 |  |        | OK   | OK                |  |   |  |  |
| 2.15          | Measure the DC resistance between the bonding cables (X point of next picture) and the unit structure as follow:     |   |        |  |                                 |  |        |  |                   |  | NOTE: Test performed during OPEN BOX test |  |  |
| 2.16          | X point VS A   |   |        |  |                                 |  |        | > 1 MΩ   | OVL               | NOTE: Test performed during OPEN BOX test                      |   |  |  |
| 2.17          | X point VS B   |   |        |  |                                 |  |        | > 1 MΩ   | OVL               | NOTE: Test performed during OPEN BOX test                      |   |  |  |
| 2.18          | X point VS C   |   |        |  |                                 |  |        | > 1 MΩ   | OVL               | NOTE: Test performed during OPEN BOX test                      |   |  |  |
| 2.19          | X point VS D   |   |        |  |                                 |  |        | > 1 MΩ   | OVL               | NOTE: Test performed during OPEN BOX test                      |   |  |  |
| 2.20          | Connect the micro-ohm meter between point x and the extreme right corner of the stiffener connected to motherboard A |   |        |  |                                 |  |        | < 2.5mΩ  | 1.5 mΩ            | NOTE: Test performed during OPEN BOX test                      |   |  |  |
| 2.21          | Connect the micro-ohm meter between point x and extreme left corner of the stiffener connected to motherboard B      |   |        |  |                                 |  |        | < 2.5mΩ  | 1.5 mΩ            | NOTE: Test performed during OPEN BOX test                      |   |  |  |
| 2.22          | Connect the X point to the bonding   |   |        |  |                                 |  |        |  |                   | NOTE: Test performed during OPEN BOX test                      |   |  |  |

|   |                  |   |
|---|------------------|---|
|  | <b>AMSO2-PDS</b> |   |
| CARLO GAVAZZI SPACE SpA   |                  | AMSO2-PDS PFM FULL FUNCTIONAL TEST REPORT |
| UUT DATA : Model PFM Item AMS02 POWER DISTRIBUTION SYSTEM                           |                  | N° Doc: Doc N°: PDS-PR-CGS-006            |
| STEP n°   | TEST SEQUENCE    | Ediz.: Issue: 2 Date: 10/06/2009          |
|   |                  | Pagina 21 di 370                          |
|   |                  | TEST PROCEDURE REFERENCE                  |
|   |                  | SIN FM01                                  |
|   |                  | TEST REPORT REFERENCE                     |

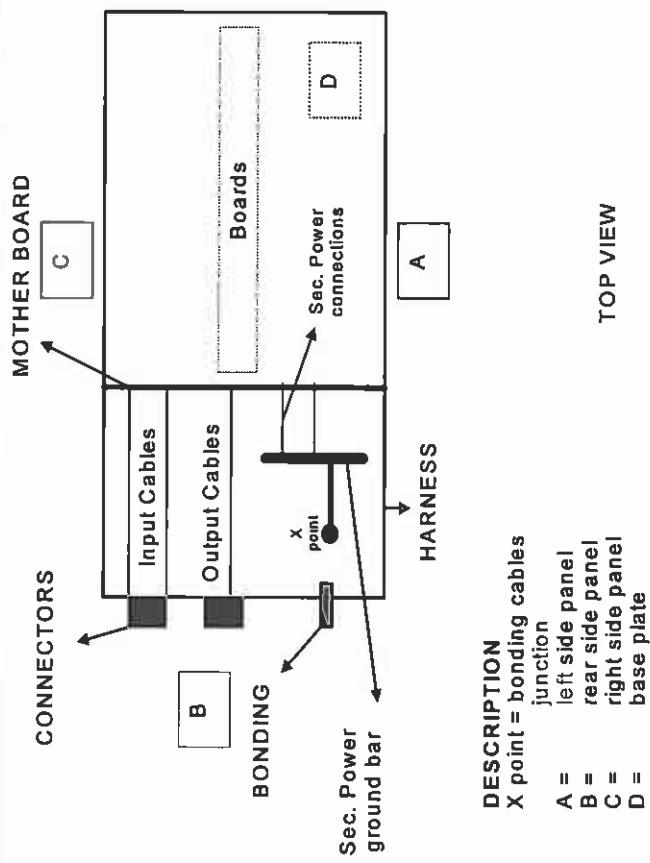
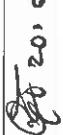


Figure 10-1: Single Point Ground Test Configuration

|   |                |    |   |          |
|---|----------------|----|---|----------|
| DATE: 10/06/09  | TEST CONDUCTOR | QA |  | CUSTOMER |
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| CARLO GAVAZZI SPACE SpA |  | AMS02-PDS PFM FULL FUNCTIONAL TEST REPORT |      | Doc N°: Ediz.: 2 Date: 10/06/2009 | Doc N°: Ediz.: 1 Date: 27/06/2009  |
| UUT DATA:               | Model  | PFM                                       | Item | PDS 22 di 370                     | Pagina 22 di 370   |
| STEP n°                 | TEST SEQUENCE  |   |      | TEST PROCEDURE REFERENCE          | TEST REPORT REFERENCE  |
| STEP n°                 | TEST SEQUENCE  | Model                                     | Item | C.I. PDS 18                       | S/N FM01   |
|                         |  |   |      | EXPECTED VALUE                    | MEASURED VALUE   |
|                         |  |   |      |                                   | REMARKS  |
| 2.23                    | The PDS shall be in OFF condition, disconnected from any cable or test equipment and placed on an insulated table. |   |      |                                   |  |
| 2.24                    | To verify the bonding requirements, measure the DC resistance:   |   |      |                                   | OBJECTIVE: Verify the DC resistance between different parts of the PDS chassis<br>SPECIAL INST.: MICRO OHM METER |
|                         | Between the connector receptacles and bonding stud:  |   |      |                                   |  |
|                         | J100   |   |      | 5mΩ                               | 3,9 mΩ   |
|                         | J101   |   |      | 5mΩ                               | 3,5 mΩ   |
|                         | J102   |   |      | 5mΩ                               | 3,4 mΩ   |
|                         | J103   |   |      | 5mΩ                               | 3,4 mΩ   |
|                         | J104   |   |      | 5mΩ                               | 3,7 mΩ   |
|                         | J110   |   |      | 5mΩ                               | 5,0 mΩ   |
|                         | J111   |   |      | 5mΩ                               | 4,0 mΩ   |
|                         | J112   |   |      | 5mΩ                               | 4,2 mΩ   |
|                         | J113   |   |      | 5mΩ                               | 5,0 mΩ   |
|                         | J120   |   |      | 5mΩ                               | 4,5 mΩ   |
|                         | J200   |   |      | 5mΩ                               | 3,8 mΩ   |
|                         | J201   |   |      | 5mΩ                               | 3,5 mΩ   |
|                         | J202   |   |      | 5mΩ                               | 5,0 mΩ   |
|                         | J203   |   |      | 5mΩ                               | 5,0 mΩ   |
|                         | J204   |   |      | 5mΩ                               | 5,0 mΩ   |
|                         | J210   |   |      | 5mΩ                               | 4,5 mΩ   |
|                         | J211   |   |      | 5mΩ                               | 3,5 mΩ   |
|                         | J212   |   |      | 5mΩ                               | 4,5 mΩ   |
|                         | J213   |   |      | 5mΩ                               | 5,0 mΩ   |
|                         | J220   |   |      | 5mΩ                               | 5,0 mΩ   |
|                         | J300   |   |      | 5mΩ                               | 5,0 mΩ   |
|                         | J121   |   |      | 5mΩ                               | 5,0 mΩ   |
|                         | J221   |   |      | 5mΩ                               | 5,0 mΩ   |
|                         | Between the walls of PDS box (see figure in the end of section):   |   |      |                                   |  |
|                         | Wall 1 and wall 3  |   |      | ≤2,5mΩ                            | 2,4 mΩ   |
|                         | 1 and 4  |   |      | ≤2,5mΩ                            | 2,5 mΩ   |
|                         | 1 and 5  |   |      | ≤2,5mΩ                            | 2,5 mΩ   |
|                         | 1 and 6  |   |      | ≤2,5mΩ                            | 1,7 mΩ   |
|                         | 2 and 3  |   |      | ≤2,5mΩ                            | 2,3 mΩ   |
|                         | 2 and 4  |   |      | ≤2,5mΩ                            | 2,4 mΩ   |
|                         | 2 and 5  |   |      | ≤2,5mΩ                            | 2,2 mΩ   |
| 2.26                    |  |   |      |                                   |  |

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| 10.06.09 |                |    |          |

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| CARLO GAVAZZI SPACE SPA |   | AMSO2-PDS PFM FULL FUNCTIONAL TEST REPORT |      | Doc N°: 2 Date: 10/06/2009      |      | Doc N°: 1 Date: 27/06/2009                     |  |
| UUT DATA :              | Model   | PFM                                       | Item | AMSO2 POWER DISTRIBUTION SYSTEM | C.I. | PDS 18   | TEST PROCEDURE REFERENCE                       |
| STEP n°                 | TEST SEQUENCE   |   |      |                                 |      | EXPECTED VALUE                                 | MEASURED VALUE                                 |
|                         |   |   |      |                                 |      | SIN  | FM01   |
| 2.27                    | To verify the power isolation, measure the DC resistance: |   |      |                                 |      | ≤2.5mΩ<br>≤2.5mΩ<br>≤2.5mΩ<br>≤2.5mΩ<br>≤2.5mΩ | 2.4 mΩ<br>2.5 mΩ<br>1.8 mΩ<br>1.2 mΩ<br>2.3 mΩ |
| 2.28                    | between bus A positive line and bus B positive line       |   |      |                                 |      |  |  |
| 2.29                    | J100 pin E Vs J200 pin E                                  |   |      |                                 |      | >1MΩ   | 20 MΩ  |
| 2.30                    | J100 pin E Vs J200 pin A                                  |   |      |                                 |      | >1MΩ   | 20 MΩ  |
| 2.31                    | J100 pin E Vs J201 pin B                                  |   |      |                                 |      | >1MΩ   | OVL  |
| 2.32                    | J100 pin A Vs J200 pin E                                  |   |      |                                 |      | >1MΩ   | OVL  |
| 2.33                    | J100 pin A Vs J200 pin A                                  |   |      |                                 |      | >1MΩ   | OVL  |
| 2.34                    | J100 pin A Vs J201 pin B                                  |   |      |                                 |      | >1MΩ   | OVL  |
| 2.35                    | J101 pin A Vs J200 pin E                                  |   |      |                                 |      | >1MΩ   | OVL  |
| 2.36                    | J101 pin A Vs J200 pin A                                  |   |      |                                 |      | >1MΩ   | OVL  |
| 2.37                    | J101 pin A Vs J201 pin B                                  |   |      |                                 |      | >1MΩ   | OVL  |
| 2.38                    | between bus A positive line and bus B return line         |   |      |                                 |      |  |  |
| 2.39                    | J100 pin E Vs J200 pin D                                  |   |      |                                 |      | >1MΩ   | OVL  |
| 2.40                    | J100 pin E Vs J200 pin B                                  |   |      |                                 |      | >1MΩ   | OVL  |
| 2.41                    | J100 pin E Vs J201 pin E                                  |   |      |                                 |      | >1MΩ   | OVL  |
| 2.42                    | J100 pin A Vs J200 pin D                                  |   |      |                                 |      | >1MΩ   | OVL  |
| 2.43                    | J100 pin A Vs J200 pin B                                  |   |      |                                 |      | >1MΩ   | OVL  |
| 2.44                    | J100 pin A Vs J201 pin E                                  |   |      |                                 |      | >1MΩ   | OVL  |
| 2.45                    | J101 pin A Vs J200 pin D                                  |   |      |                                 |      | >1MΩ   | OVL  |
| 2.46                    | J101 pin A Vs J200 pin B                                  |   |      |                                 |      | >1MΩ   | OVL  |
| 2.47                    | J101 pin A Vs J201 pin E                                  |   |      |                                 |      | >1MΩ   | OVL  |

DATE: 10.06.09 TEST CONDUCTOR *Patrizio* QA

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| AMS02-PDS      |  |     |      | N° Doc: PDS-PR-CGS-006<br>Doc N°: PDS-RP-CGS-072                                       | Ediz.: 2<br>Issue: 1   | Data: 10/06/2009<br>Date: 27/06/2009 | Ediz.: 1<br>Issue: 1 | Data: 27/06/2009<br>Date: di of 370 |
|----------------|--|-----|------|--|--|--------------------------------------|----------------------|-------------------------------------|
| UUT DATA :     | Model  | PFM | Item | AMS02 POWER DISTRIBUTION SYSTEM  | C.I.   | PDS 18                               | SIN                  | FM01                                |
| STEP n°        | TEST SEQUENCE  |     |      |  | EXPECTED VALUE   | MEASURED VALUE                       | REMARKS              |                                     |
| 2.48           | between bus A return line and bus B positive line  |     |      |  | >1MΩ   | OVL                                  |                      |                                     |
| 2.49           | J100 pin D Vs J200 pin E   |     |      |  | >1MΩ   | OVL                                  |                      |                                     |
| 2.50           | J100 pin D Vs J200 pin A   |     |      |  | >1MΩ   | OVL                                  |                      |                                     |
| 2.51           | J100 pin D Vs J201 pin D   |     |      |  | >1MΩ   | OVL                                  |                      |                                     |
| 2.52           | J100 pin B Vs J200 pin E   |     |      |  | >1MΩ   | OVL                                  |                      |                                     |
| 2.53           | J100 pin B Vs J200 pin A   |     |      |  | >1MΩ   | OVL                                  |                      |                                     |
| 2.54           | J100 pin B Vs J201 pin D   |     |      |  | >1MΩ   | OVL                                  |                      |                                     |
| 2.55           | J101 pin G Vs J200 pin E   |     |      |  | >1MΩ   | OVL                                  |                      |                                     |
| 2.56           | J101 pin G Vs J200 pin A   |     |      |  | >1MΩ   | OVL                                  |                      |                                     |
| 2.57           | J101 pin G Vs J201 pin D   |     |      |  | >1MΩ   | OVL                                  |                      |                                     |
| 2.58           | between bus A return line and bus B return line  |     |      |  | >1MΩ   | OVL                                  |                      |                                     |
| 2.59           | J100 pin D Vs J200 pin D   |     |      |  | >1MΩ   | OVL                                  |                      |                                     |
| 2.60           | J100 pin D Vs J200 pin B   |     |      |  | >1MΩ   | OVL                                  |                      |                                     |
| 2.61           | J100 pin D Vs J201 pin E   |     |      |  | >1MΩ   | OVL                                  |                      |                                     |
| 2.62           | J100 pin B Vs J200 pin D   |     |      |  | >1MΩ   | OVL                                  |                      |                                     |
| 2.63           | J100 pin B Vs J200 pin B   |     |      |  | >1MΩ   | OVL                                  |                      |                                     |
| 2.64           | J100 pin B Vs J201 pin E   |     |      |  | >1MΩ   | OVL                                  |                      |                                     |
| 2.65           | J101 pin G Vs J200 pin D   |     |      |  | >1MΩ   | OVL                                  |                      |                                     |
| 2.66           | J101 pin G Vs J200 pin B   |     |      |  | >1MΩ   | OVL                                  |                      |                                     |
| 2.67           | J101 pin G Vs J201 pin E   |     |      |  | >1MΩ   | OVL                                  |                      |                                     |
| 2.68           | between positive and return of input busses  |     |      |  |  |                                      |                      |                                     |
| 2.69           | J100 pin E Vs J100 pin D   |     |      |  | >16.5 kΩ   | 109kΩ                                |                      |                                     |
| 2.70           | J100 pin A Vs J100 pin B   |     |      |  | >16.5 kΩ   | 118kΩ                                |                      |                                     |
| 2.71           | J101 pin A Vs J101 pin G   |     |      |  | >16.5 kΩ   | 218kΩ                                |                      |                                     |
| 2.72           | J100 pin D Vs J100 pin E   |     |      |  | >16.5 kΩ   | 103kΩ                                |                      |                                     |
| 2.73           | J100 pin B Vs J100 pin A   |     |      |  | >16.5 kΩ   | 400kΩ                                |                      |                                     |
| 2.74           | J101 pin G Vs J101 pin A   |     |      |  | >16.5 kΩ   | 399kΩ                                |                      |                                     |
| 2.75           | J201 pin E Vs J201 pin D   |     |      |  | >16.5 kΩ   | 399kΩ                                |                      |                                     |
| 2.76           | J200 pin A Vs J200 pin B   |     |      |  | >16.5 kΩ   | 220kΩ                                |                      |                                     |
| 2.77           | J200 pin D Vs J200 pin E   |     |      |  | >16.5 kΩ   | 103kΩ                                |                      |                                     |
| 2.78           | J201 pin D Vs J201 pin E   |     |      |  | >16.5 kΩ   | 216kΩ                                |                      |                                     |
| 2.79           | J200 pin B Vs J200 pin A   |     |      |  | >16.5 kΩ   | 399kΩ                                |                      |                                     |
| 2.80           | J200 pin E Vs J200 pin D   |     |      |  | >16.5 kΩ   | 109kΩ                                |                      |                                     |
| 2.81           | To verify the power isolation between bus A positive line and BONDING                                |     |      |  |  |                                      |                      |                                     |
| 2.82           | J100 pin E Vs BONDING  |     |      |  | >1MΩ   | OVL                                  |                      |                                     |
| 2.83           | J100 pin A Vs BONDING  |     |      |  | >1MΩ   | OVL                                  |                      |                                     |
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|-------------------------|---|---|------|---------------------------------|------------------|--------------------------|-----------------------|
| CARLO GAVAZZI SPACE SpA |   | AMSO2-PDS PFM FULL FUNCTIONAL TEST REPORT |      | Doc N°: Ediz.: /Issue:          | Date: 10/06/2009 | Doc N°: Ediz.: /Issue:   | Date: 27/06/2009      |
| UUT DATA :              | Model   | PFM                                       | Item | AMSO2 POWER DISTRIBUTION SYSTEM | C.I.             | TEST PROCEDURE REFERENCE | TEST REPORT REFERENCE |
| STEP n°                 | TEST SEQUENCE   |   |      |                                 | EXPECTED VALUE   | MEASURED VALUE           | REMARKS               |
| 2.84                    | J101 pin A Vs BONDING   |   |      |                                 | >1MΩ             | OVL                      |                       |
| 2.85                    | To verify the power isolation between bus A return line and BONDING   |   |      |                                 |                  |                          |                       |
| 2.86                    | J100 pin D Vs BONDING   |   |      |                                 | >1MΩ             | OVL                      |                       |
| 2.87                    | J100 pin B Vs BONDING   |   |      |                                 | >1MΩ             | OVL                      |                       |
| 2.88                    | J101 pin G Vs BONDING   |   |      |                                 | >1MΩ             | OVL                      |                       |
| 2.89                    | To verify the power isolation between bus B positive line and BONDING |   |      |                                 |                  |                          |                       |
| 2.90                    | J200 pin E Vs BONDING   |   |      |                                 | >1MΩ             | OVL                      |                       |
| 2.91                    | J200 pin A Vs BONDING   |   |      |                                 | >1MΩ             | OVL                      |                       |
| 2.92                    | J201 pin D Vs BONDING   |   |      |                                 | >1MΩ             | OVL                      |                       |
| 2.93                    | To verify the power isolation between bus B return line and BONDING   |   |      |                                 |                  |                          |                       |
| 2.94                    | J200 pin D Vs BONDING   |   |      |                                 | >1MΩ             | OVL                      |                       |
| 2.95                    | J200 pin B Vs BONDING   |   |      |                                 | >1MΩ             | OVL                      |                       |
| 2.96                    | J201 pin E Vs BONDING   |   |      |                                 | >1MΩ             | OVL                      |                       |
| 2.97                    | To verify the power isolation between output lines and bonding        |   |      |                                 |                  |                          |                       |
| 2.98                    | J102 pin L Vs BONDING   |   |      |                                 | >1MΩ             | OVL                      |                       |
| 2.99                    | J102 pin D Vs BONDING   |   |      |                                 | >1MΩ             | OVL                      |                       |
| 2.100                   | J103 pin G Vs BONDING   |   |      |                                 | >1MΩ             | OVL                      |                       |
| 2.101                   | J103 pin H Vs BONDING   |   |      |                                 | >1MΩ             | OVL                      |                       |
| 2.102                   | J103 pin J Vs BONDING   |   |      |                                 | >1MΩ             | OVL                      |                       |
| 2.103                   | J103 pin A Vs BONDING   |   |      |                                 | >1MΩ             | OVL                      |                       |
| 2.104                   | J103 pin C Vs BONDING   |   |      |                                 | >1MΩ             | OVL                      |                       |
| 2.105                   | J103 pin P Vs BONDING   |   |      |                                 | >1MΩ             | OVL                      |                       |
| 2.106                   | J104 pin A Vs BONDING   |   |      |                                 | >1MΩ             | OVL                      |                       |
| 2.107                   | J104 pin L Vs BONDING   |   |      |                                 | >1MΩ             | OVL                      |                       |
| 2.108                   | J104 pin D Vs BONDING   |   |      |                                 | >1MΩ             | OVL                      |                       |
| 2.109                   | J104 pin C Vs BONDING   |   |      |                                 | >1MΩ             | OVL                      |                       |
| 2.110                   | J104 pin G Vs BONDING   |   |      |                                 | >1MΩ             | OVL                      |                       |
| 2.111                   | J110 pin A Vs BONDING   |   |      |                                 | >1MΩ             | OVL                      |                       |
| 2.112                   | J110 pin J Vs BONDING   |   |      |                                 | >1MΩ             | OVL                      |                       |
| 2.113                   | J110 pin F Vs BONDING   |   |      |                                 | >1MΩ             | OVL                      |                       |
| 2.114                   | J110 pin L Vs BONDING   |   |      |                                 | >1MΩ             | OVL                      |                       |
| 2.115                   | J110 pin C Vs BONDING   |   |      |                                 | >1MΩ             | OVL                      |                       |
| 2.116                   | J111 pin B Vs BONDING   |   |      |                                 | >1MΩ             | OVL                      |                       |
| 2.117                   | J111 pin A Vs BONDING   |   |      |                                 | >1MΩ             | OVL                      |                       |
| 2.118                   | J111 pin K Vs BONDING   |   |      |                                 | >1MΩ             | OVL                      |                       |
| 2.119                   | J111 pin L Vs BONDING   |   |      |                                 | >1MΩ             | OVL                      |                       |

DATE: 10.06.09 TEST CONDUCTOR *G. Zanella*

QA

CUSTOMER  
*[Signature]*

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| <br><b>CARLO GAVAZZI</b> |  | <h1 style="text-align: center;"><b>AMS02-PDS</b></h1> <p style="text-align: center;">AMS02-PDS PFM FULL FUNCTIONAL TEST REPORT</p> |             | <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;">N° Doc:<br/>Doc N°:<br/>Ediz.:<br/>Issue:</td><td style="width: 50%;">PDS-PR-CGS-006<br/>Data:<br/>Date:<br/>Page</td></tr> <tr> <td style="width: 50%;">2</td><td style="width: 50%;">10/06/2009<br/>di<br/>of</td></tr> <tr> <td style="width: 50%;">Pagina<br/>Page</td><td style="width: 50%;">26<br/>di<br/>370</td></tr> </table> |                | N° Doc:<br>Doc N°:<br>Ediz.:<br>Issue: | PDS-PR-CGS-006<br>Data:<br>Date:<br>Page | 2 | 10/06/2009<br>di<br>of | Pagina<br>Page | 26<br>di<br>370 | <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;">N° Doc:<br/>Doc N°:<br/>Ediz.:<br/>Issue:</td><td style="width: 50%;">PDS-RP-CGS-072<br/>Data:<br/>Date:<br/>Page</td></tr> <tr> <td style="width: 50%;">1</td><td style="width: 50%;">27/06/2009<br/>di<br/>of</td></tr> <tr> <td style="width: 50%;">Pagina<br/>Page</td><td style="width: 50%;">26<br/>di<br/>370</td></tr> </table> |  | N° Doc:<br>Doc N°:<br>Ediz.:<br>Issue: | PDS-RP-CGS-072<br>Data:<br>Date:<br>Page | 1 | 27/06/2009<br>di<br>of | Pagina<br>Page | 26<br>di<br>370 |
|---|--|--|-------------|---|----------------|--|--|---|------------------------|----------------|-----------------|---|--|--|--|---|------------------------|----------------|-----------------|
| N° Doc:<br>Doc N°:<br>Ediz.:<br>Issue:  | PDS-PR-CGS-006<br>Data:<br>Date:<br>Page |  |             |   |                |  |  |   |                        |                |                 |   |  |  |  |   |                        |                |                 |
| 2   | 10/06/2009<br>di<br>of                   |  |             |   |                |  |  |   |                        |                |                 |   |  |  |  |   |                        |                |                 |
| Pagina<br>Page  | 26<br>di<br>370                          |  |             |   |                |  |  |   |                        |                |                 |   |  |  |  |   |                        |                |                 |
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| 1   | 27/06/2009<br>di<br>of                   |  |             |   |                |  |  |   |                        |                |                 |   |  |  |  |   |                        |                |                 |
| Pagina<br>Page  | 26<br>di<br>370                          |  |             |   |                |  |  |   |                        |                |                 |   |  |  |  |   |                        |                |                 |
| <b>UUT DATA :</b>   |  | <b>AMS02 POWER DISTRIBUTION SYSTEM</b>   |             | <b>TEST PROCEDURE REFERENCE</b>   |                | <b>TEST REPORT REFERENCE</b>           |  |   |                        |                |                 |   |  |  |  |   |                        |                |                 |
| <b>STEP n°</b>  | <b>TEST SEQUENCE</b>                     | <b>Item</b>  | <b>C.I.</b> | <b>PDS 18</b>   | <b>S/N</b>     | <b>FM01</b>                            |  |   |                        |                |                 |   |  |  |  |   |                        |                |                 |
| STEP n°   | TEST SEQUENCE                            | Item   | C.I.        | PDS 18  | EXPECTED VALUE | MEASURED VALUE                         | REMARKS                                  |   |                        |                |                 |   |  |  |  |   |                        |                |                 |
| 2.120   | J111 pin E vs BONDING                    |  |             |   | >1MΩ           | OVL                                    |  |   |                        |                |                 |   |  |  |  |   |                        |                |                 |
| 2.121   | J112 pin E vs BONDING                    |  |             |   | >1MΩ           | OVL                                    |  |   |                        |                |                 |   |  |  |  |   |                        |                |                 |
| 2.122   | J112 pin B vs BONDING                    |  |             |   | >1MΩ           | OVL                                    |  |   |                        |                |                 |   |  |  |  |   |                        |                |                 |
| 2.123   | J112 pin K vs BONDING                    |  |             |   | >1MΩ           | OVL                                    |  |   |                        |                |                 |   |  |  |  |   |                        |                |                 |
| 2.124   | J112 pin L vs BONDING                    |  |             |   | >1MΩ           | OVL                                    |  |   |                        |                |                 |   |  |  |  |   |                        |                |                 |
| 2.125   | J112 pin A vs BONDING                    |  |             |   | >1MΩ           | OVL                                    |  |   |                        |                |                 |   |  |  |  |   |                        |                |                 |
| 2.126   | J113 pin B vs BONDING                    |  |             |   | >1MΩ           | OVL                                    |  |   |                        |                |                 |   |  |  |  |   |                        |                |                 |
| 2.127   | J113 pin E vs BONDING                    |  |             |   | >1MΩ           | OVL                                    |  |   |                        |                |                 |   |  |  |  |   |                        |                |                 |
| 2.128   | J113 pin A vs BONDING                    |  |             |   | >1MΩ           | OVL                                    |  |   |                        |                |                 |   |  |  |  |   |                        |                |                 |
| 2.129   | J113 pin K vs BONDING                    |  |             |   | >1MΩ           | OVL                                    |  |   |                        |                |                 |   |  |  |  |   |                        |                |                 |
| 2.130   | J113 pin L vs BONDING                    |  |             |   | >1MΩ           | OVL                                    |  |   |                        |                |                 |   |  |  |  |   |                        |                |                 |
| 2.131   | J202 pin L vs BONDING                    |  |             |   | >1MΩ           | OVL                                    |  |   |                        |                |                 |   |  |  |  |   |                        |                |                 |
| 2.132   | J203 pin G vs BONDING                    |  |             |   | >1MΩ           | OVL                                    |  |   |                        |                |                 |   |  |  |  |   |                        |                |                 |
| 2.133   | J203 pin H vs BONDING                    |  |             |   | >1MΩ           | OVL                                    |  |   |                        |                |                 |   |  |  |  |   |                        |                |                 |
| 2.134   | J203 pin J vs BONDING                    |  |             |   | >1MΩ           | OVL                                    |  |   |                        |                |                 |   |  |  |  |   |                        |                |                 |
| 2.135   | J203 pin A vs BONDING                    |  |             |   | >1MΩ           | OVL                                    |  |   |                        |                |                 |   |  |  |  |   |                        |                |                 |
| 2.136   | J203 pin C vs BONDING                    |  |             |   | >1MΩ           | OVL                                    |  |   |                        |                |                 |   |  |  |  |   |                        |                |                 |
| 2.137   | J203 pin P vs BONDING                    |  |             |   | >1MΩ           | OVL                                    |  |   |                        |                |                 |   |  |  |  |   |                        |                |                 |
| 2.138   | J204 pin A vs BONDING                    |  |             |   | >1MΩ           | OVL                                    |  |   |                        |                |                 |   |  |  |  |   |                        |                |                 |
| 2.139   | J204 pin L vs BONDING                    |  |             |   | >1MΩ           | OVL                                    |  |   |                        |                |                 |   |  |  |  |   |                        |                |                 |
| 2.140   | J204 pin D vs BONDING                    |  |             |   | >1MΩ           | OVL                                    |  |   |                        |                |                 |   |  |  |  |   |                        |                |                 |
| 2.141   | J204 pin C vs BONDING                    |  |             |   | >1MΩ           | OVL                                    |  |   |                        |                |                 |   |  |  |  |   |                        |                |                 |
| 2.142   | J204 pin G vs BONDING                    |  |             |   | >1MΩ           | OVL                                    |  |   |                        |                |                 |   |  |  |  |   |                        |                |                 |
| 2.143   | J210 pin A vs BONDING                    |  |             |   | >1MΩ           | OVL                                    |  |   |                        |                |                 |   |  |  |  |   |                        |                |                 |
| 2.144   | J210 pin F vs BONDING                    |  |             |   | >1MΩ           | OVL                                    |  |   |                        |                |                 |   |  |  |  |   |                        |                |                 |
| 2.145   | J210 pin J vs BONDING                    |  |             |   | >1MΩ           | OVL                                    |  |   |                        |                |                 |   |  |  |  |   |                        |                |                 |
| 2.146   | J210 pin L vs BONDING                    |  |             |   | >1MΩ           | OVL                                    |  |   |                        |                |                 |   |  |  |  |   |                        |                |                 |
| 2.147   | J211 pin B vs BONDING                    |  |             |   | >1MΩ           | OVL                                    |  |   |                        |                |                 |   |  |  |  |   |                        |                |                 |
| 2.148   | J211 pin K vs BONDING                    |  |             |   | >1MΩ           | OVL                                    |  |   |                        |                |                 |   |  |  |  |   |                        |                |                 |
| 2.149   | J211 pin E vs BONDING                    |  |             |   | >1MΩ           | OVL                                    |  |   |                        |                |                 |   |  |  |  |   |                        |                |                 |
| 2.150   | J212 pin E vs BONDING                    |  |             |   | >1MΩ           | OVL                                    |  |   |                        |                |                 |   |  |  |  |   |                        |                |                 |
| 2.151   | J212 pin K vs BONDING                    |  |             |   | >1MΩ           | OVL                                    |  |   |                        |                |                 |   |  |  |  |   |                        |                |                 |
| 2.152   | J213 pin B vs BONDING                    |  |             |   | >1MΩ           | OVL                                    |  |   |                        |                |                 |   |  |  |  |   |                        |                |                 |
| 2.153   | J213 pin E vs BONDING                    |  |             |   | >1MΩ           | OVL                                    |  |   |                        |                |                 |   |  |  |  |   |                        |                |                 |
| 2.154   | J213 pin K vs BONDING                    |  |             |   | >1MΩ           | OVL                                    |  |   |                        |                |                 |   |  |  |  |   |                        |                |                 |
| 2.155   | J121 pin G vs BONDING                    |  |             |   | >1MΩ           | OVL                                    |  |   |                        |                |                 |   |  |  |  |   |                        |                |                 |

DATE: **10/06/09** TEST CONDUCTOR **QA** **✓**

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| CARLO GAVAZZI SPACE SpA |   | AMS02-PDS PFM FULL FUNCTIONAL TEST REPORT |      | Doc N°: Ediz.: Issue:           | 2 Data: Date:  | 1 Data: Date:          | 1                        |
| UUT DATA :              | Model   | PFM                                       | Item | AMS02 POWER DISTRIBUTION SYSTEM | C.I.           | PDS 18                 | TEST PROCEDURE REFERENCE |
| STEP n°                 | TEST SEQUENCE   |   |      | EXPECTED VALUE                  | MEASURED VALUE | S/N                    | TEST REPORT REFERENCE    |
|                         |   |   |      |                                 |                |                        | FM01                     |
| 2.156                   | J121 pin H  | vs BONDING                                | G    | >1MΩ                            | OVL            |                        |                          |
| 2.157                   | J121 pin J  | vs BONDING                                | G    | >1MΩ                            | OVL            |                        |                          |
| 2.158                   | J121 pin F  | vs BONDING                                | G    | >1MΩ                            | OVL            |                        |                          |
| 2.159                   | J121 pin S  | vs BONDING                                | G    | >1MΩ                            | OVL            |                        |                          |
| 2.160                   | J121 pin T  | vs BONDING                                | G    | >1MΩ                            | OVL            |                        |                          |
| 2.161                   | J121 pin K  | vs BONDING                                | G    | >1MΩ                            | OVL            |                        |                          |
| 2.162                   | J121 pin A  | vs BONDING                                | G    | >1MΩ                            | OVL            |                        |                          |
| 2.163                   | J121 pin B  | vs BONDING                                | G    | >1MΩ                            | OVL            |                        |                          |
| 2.164                   | J121 pin C  | vs BONDING                                | G    | >1MΩ                            | OVL            |                        |                          |
| 2.165                   | J121 pin L  | vs BONDING                                | G    | >1MΩ                            | OVL            |                        |                          |
| 2.166                   | J121 pin N  | vs BONDING                                | G    | >1MΩ                            | OVL            |                        |                          |
| 2.167                   | J121 pin P  | vs BONDING                                | G    | >1MΩ                            | OVL            |                        |                          |
| 2.168                   | J121 pin D  | vs BONDING                                | G    | >1MΩ                            | OVL            |                        |                          |
| 2.169                   | J221 pin G  | vs BONDING                                | G    | >1MΩ                            | OVL            |                        |                          |
| 2.170                   | J221 pin H  | vs BONDING                                | G    | >1MΩ                            | OVL            |                        |                          |
| 2.171                   | J221 pin J  | vs BONDING                                | G    | >1MΩ                            | OVL            |                        |                          |
| 2.172                   | J221 pin F  | vs BONDING                                | G    | >1MΩ                            | OVL            |                        |                          |
| 2.173                   | J221 pin S  | vs BONDING                                | G    | >1MΩ                            | OVL            |                        |                          |
| 2.174                   | J221 pin T  | vs BONDING                                | G    | >1MΩ                            | OVL            |                        |                          |
| 2.175                   | J221 pin K  | vs BONDING                                | G    | >1MΩ                            | OVL            |                        |                          |
| 2.176                   | J221 pin A  | vs BONDING                                | G    | >1MΩ                            | OVL            |                        |                          |
| 2.177                   | J221 pin B  | vs BONDING                                | G    | >1MΩ                            | OVL            |                        |                          |
| 2.178                   | J221 pin C  | vs BONDING                                | G    | >1MΩ                            | OVL            |                        |                          |
| 2.179                   | J221 pin L  | vs BONDING                                | G    | >1MΩ                            | OVL            |                        |                          |
| 2.180                   | J221 pin N  | vs BONDING                                | G    | >1MΩ                            | OVL            |                        |                          |
| 2.181                   | J221 pin P  | vs BONDING                                | G    | >1MΩ                            | OVL            |                        |                          |
| 2.182                   | J221 pin D  | vs BONDING                                | G    | >1MΩ                            | OVL            |                        |                          |
| 2.183                   | Between 28V output return and bonding : this measurement is to check that the secondary returns are connected to bonding. The measure is affected by the presence of the savers that are build in house with cabling elongation |   |      |                                 |                |                        |                          |
| 2.184                   | J110 pin B  | vs BONDING                                | G    | <1Ω                             | 7 mΩ           |                        |                          |
| 2.185                   | J110 pin V  | vs BONDING                                | G    | <1Ω                             | 10 mΩ          |                        |                          |
| 2.186                   | J110 pin H  | vs BONDING                                | G    | <1Ω                             | 10 mΩ          |                        |                          |
| 2.187                   | J110 pin X  | vs BONDING                                | G    | <1Ω                             | 8 mΩ           |                        |                          |
| 2.188                   | J110 pin A  | vs BONDING                                | G    | <1Ω                             | 11 mΩ          |                        |                          |
| 2.189                   | J111 pin d  | vs BONDING                                | G    | <1Ω                             | 12 mΩ          |                        |                          |

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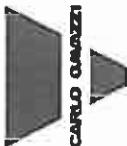
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| CARLO GAVAZZI SPACE SpA |                       | AMSS02-PDS PFM FULL FUNCTIONAL TEST REPORT |                                  | Doc N°: Ediz.: Issue:  | 2 Data: Date: | 1 Data: Date:          |         |
| UUT DATA :              | Model                 | Item                                       | AMSS02 POWER DISTRIBUTION SYSTEM | C.I.                   | PDS 18        | SIN                    | FM01    |
| STEP n°                 | TEST SEQUENCE         |  |                                  |                        |               |                        | REMARKS |
| 2.190                   | J111 pin c vs BONDING |  |                                  |                        | <1Ω           | 12 mΩ                  |         |
| 2.191                   | J111 pin J vs BONDING |  |                                  |                        | <1Ω           | 11 mΩ                  |         |
| 2.192                   | J111 pin a vs BONDING |  |                                  |                        | <1Ω           | 12 mΩ                  |         |
| 2.193                   | J111 pin H vs BONDING |  |                                  |                        | <1Ω           | 13 mΩ                  |         |
| 2.194                   | J112 pin H vs BONDING |  |                                  |                        | <1Ω           | 12 mΩ                  |         |
| 2.195                   | J112 pin d vs BONDING |  |                                  |                        | <1Ω           | 12 mΩ                  |         |
| 2.196                   | J112 pin J vs BONDING |  |                                  |                        | <1Ω           | 12 mΩ                  |         |
| 2.197                   | J112 pin a vs BONDING |  |                                  |                        | <1Ω           | 12 mΩ                  |         |
| 2.198                   | J112 pin c vs BONDING |  |                                  |                        | <1Ω           | 12 mΩ                  |         |
| 2.199                   | J113 pin d vs BONDING |  |                                  |                        | <1Ω           | 22 mΩ                  |         |
| 2.200                   | J113 pin H vs BONDING |  |                                  |                        | <1Ω           | 21 mΩ                  |         |
| 2.201                   | J113 pin c vs BONDING |  |                                  |                        | <1Ω           | 21 mΩ                  |         |
| 2.202                   | J113 pin J vs BONDING |  |                                  |                        | <1Ω           | 21 mΩ                  |         |
| 2.203                   | J113 pin a vs BONDING |  |                                  |                        | <1Ω           | 21 mΩ                  |         |
| 2.204                   | J210 pin B vs BONDING |  |                                  |                        | <1Ω           | 17 mΩ                  |         |
| 2.205                   | J210 pin H vs BONDING |  |                                  |                        | <1Ω           | 20 mΩ                  |         |
| 2.206                   | J210 pin a vs BONDING |  |                                  |                        | <1Ω           | 19 mΩ                  |         |
| 2.207                   | J210 pin X vs BONDING |  |                                  |                        | <1Ω           | 17 mΩ                  |         |
| 2.208                   | J211 pin A vs BONDING |  |                                  |                        | <1Ω           | 22 mΩ                  |         |
| 2.209                   | J211 pin J vs BONDING |  |                                  |                        | <1Ω           | 22 mΩ                  |         |
| 2.210                   | J211 pin H vs BONDING |  |                                  |                        | <1Ω           | 21 mΩ                  |         |
| 2.211                   | J212 pin H vs BONDING |  |                                  |                        | <1Ω           | 22 mΩ                  |         |
| 2.212                   | J212 pin J vs BONDING |  |                                  |                        | <1Ω           | 22 mΩ                  |         |
| 2.213                   | J213 pin A vs BONDING |  |                                  |                        | <1Ω           | 22 mΩ                  |         |
| 2.214                   | J213 pin H vs BONDING |  |                                  |                        | <1Ω           | 22 mΩ                  |         |
| 2.215                   | J213 pin J vs BONDING |  |                                  |                        | <1Ω           | 21 mΩ                  |         |

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| <br><b>AMSO2-PDS</b><br><b>AMS02-PDS PFM FULL FUNCTIONAL TEST REPORT</b><br><b>CARLO GAVAZZI SPACE SpA</b> |  | N° Doc:<br>Doc N°:<br>Ediz.:<br>Issue:<br>Pagina<br>Page                        |  | N° Doc:<br>Doc N°:<br>Ediz.:<br>Issue:<br>Pagina<br>Page               |  |
|   |  | <b>PDS-PR-CGS-006</b><br><b>2</b><br><b>Date:</b><br><b>10/06/2009</b>          |  | <b>PDS-RP-CGS-072</b><br><b>1</b><br><b>Date:</b><br><b>27/06/2009</b> |  |
|   |  |   |  |  |  |
| <b>UUT DATA :</b><br><b>Model</b> <b>PFM</b><br><b>TEST SEQUENCE</b>  |  | <b>Item</b> <b>AMSO2 POWER DISTRIBUTION SYSTEM</b><br><b>C.I.</b> <b>PDS 18</b> |  | <b>TEST PROCEDURE REFERENCE</b><br><b>S/N</b> <b>FM01</b>              |  |
| <b>STEP n°</b>  | <b>EXPECTED VALUE</b> <b>MEASURED VALUE</b> <b>REMARKS</b> |   |  |  |  |

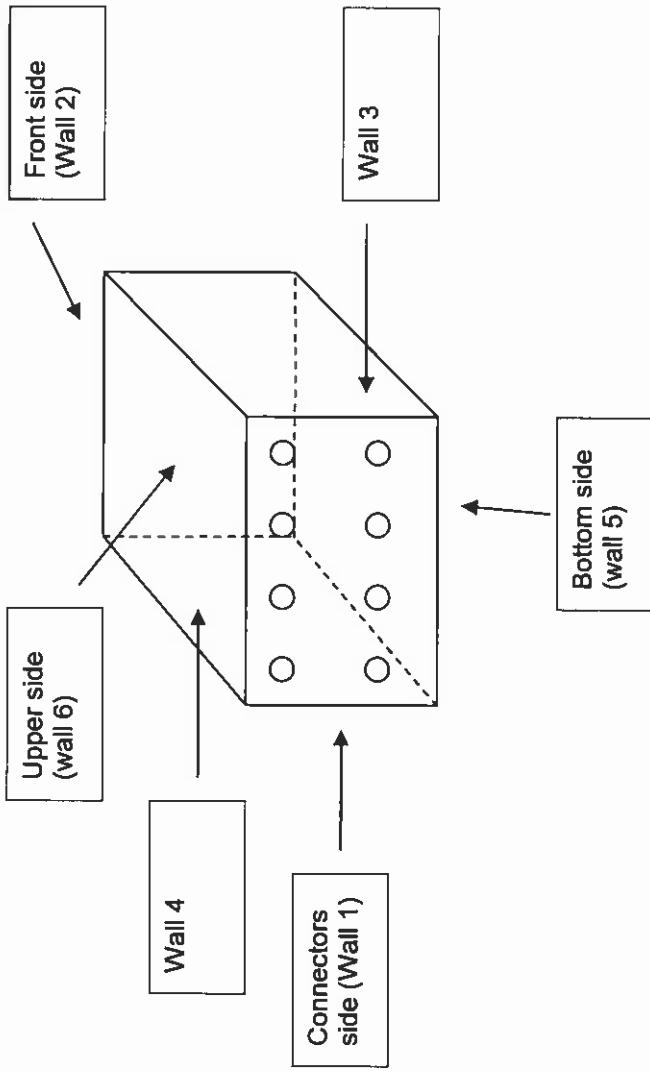
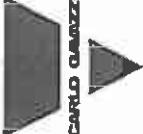


Figure 10-2: Walls numeration for bonding verification

|   |                |    |          |
|---|----------------|----|----------|
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| 10/06/09  |                |    |          |
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|---|---|--|---------------------------------|--|---------------------------------|
|  | <b>AMS02-PDS</b>                          | N° Doc:<br>Doc N°:<br>Ediz.:<br>Issue: | <b>PDS-PR-CGS-006</b>           | N° Doc:<br>Doc N°:<br>Ediz.:<br>Issue: | <b>PDS-RP-CGS-072</b>           |
| CARLO GAVAZZI SPACE SpA   | AMS02-PDS PFM FULL FUNCTIONAL TEST REPORT | 2<br>Date:<br>Pagina<br>Page           | 10/06/2009<br>Date:<br>di<br>of | 1<br>Page:<br>Pagina<br>Page           | 27/06/2009<br>Date:<br>di<br>of |
|   |   | 30<br>di<br>of                         | 370                             | 30<br>di<br>of                         | 370                             |

| UUT DATA : | Model         | PFM | Item | AMS02 POWER DISTRIBUTION SYSTEM | C.I. | TEST PROCEDURE REFERENCE |                | TEST REPORT REFERENCE |
|------------|---------------|-----|------|---------------------------------|------|--------------------------|----------------|-----------------------|
|            |               |     |      |                                 |      | EXPECTED VALUE           | MEASURED VALUE |                       |
| STEP n°    | TEST SEQUENCE |     |      |                                 |      |                          |                | S/N FM01              |

## 10.3 FUNCTIONAL VERIFICATION

### 10.3.1 A SECTION

#### 10.3.1.1 SETUP

|         |  |                   |                   |  |
|---------|--|-------------------|-------------------|--|
| 3.1.1.1 | Verify that the "power switch box" is connected between power supply alim and PDS cables | Connected         | Connected         |  |
| 3.1.1.2 | Verify that the "power switch" of the "power switch box" is set in OFF position          | OFF               | OFF               |  |
| 3.1.1.3 | Verify that all load are connected except for external heaters                           | Connected         | Connected         |  |
| 3.1.1.4 | Set all the loads to 0A current absorption (external heaters included)                   | 0A absorption set | 0A absorption set |  |
| 3.1.1.5 | Launch the PDS controller software and select FM in the Model window                     | Program open      | Program open      |  |
| 3.1.1.6 | Launch the USCM controller software: Open the file "USCM"                                | File open         | File open         |  |

#### 10.3.1.2 POWER ON WITH ISS MAIN BUS

|          |   |                   |                |   |
|----------|---|-------------------|----------------|---|
| 3.1.2.1  | Connect main power supply between AI_120V (positive) and AI_120V_RTN (negative)           | J100 connected    | J100 connected |   |
| 3.1.2.2  | Set Power supply alim to 120V   | 120,00V±1,00V     | 120V           |   |
| 3.1.2.3  | Set output current limitation to 3A   | 3A±0,5A           | 3A             |   |
| 3.1.2.4  | Enable power supply output  | enabled           | Ok             |   |
| 3.1.2.5  | Verify that green led of "power switch box" is lighted                                    | Green led lighted | Ok             |   |
| 3.1.2.6  | Switch ON the "power switch" of "power switch box"  | Switch ON         | Ok             |   |
| 3.1.2.7  | Verify that red led of "power switch box" is lighted                                      | Red led lighted   | Ok             |   |
| 3.1.2.8  | Verify the current absorption from Main Bus   | 1,10A±0,20A       | 1,1A           |   |
| 3.1.2.9  | Unmated connectors verification   |                   |                | Note: this current can be read from power supply display or ammeter. In case of power supply reading, verify the correctness of measurements. |
| 3.1.2.10 | Measure with multimeter the voltage between 1P_120V (positive) and 1P_120V_RTN (negative) | <5V               | 0,0V           |   |
| 3.1.2.11 | Measure with multimeter the voltage between T0_120V (positive) and T0_120V_RTN (negative) | <5V               | 0,0V           |   |

|  |  |  |   |
|--|--|--|---|
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|--|---------------|--|---------------------------------|--|
| OUT DATA :   |               | Model  | PFM                             | TEST PROCEDURE REFERENCE   |
| STEP n°  | TEST SEQUENCE | Item   | AMS02 POWER DISTRIBUTION SYSTEM | C.I. PDS 18  |
|  |               |  |                                 | SIN FM01   |
|  |               |  |                                 | TEST REPORT REFERENCE  |

### 10.3.1.2.1 CAN BUS COMMUNICATION LINE CHECK BOARD 30

| Step     | Description   | USCM selected   | USCM selected   |
|----------|---|-----------------|-----------------|
| 3.1.2.12 | Objective: To verify the external CAN BUS lines communication | 30              | 30              |
| 3.1.2.13 | Select USCM controller software                               | 0               | 0               |
| 3.1.2.14 | set the CAN BUS board address to 30 in the command widow      | A               | A               |
| 3.1.2.15 | Select JMDC = 0   | A               | A               |
| 3.1.2.16 | Select TX = A   | Command execute | Command execute |
| 3.1.2.17 | Select RX = A   | OK              | OK              |
| 3.1.2.18 | press button READ and verify on the command status window     | PDS PROM        | PDS PROM        |
| 3.1.2.19 | Verify MODE window  | 26-Jan-09 17:06 | 26-Jan-09 17:06 |
| 3.1.2.20 | Verify Version window   | POWER ON 0      | POWER ON 0      |
| 3.1.2.21 | Select Select TX = B  | B               | B               |
| 3.1.2.22 | Select RX = B   | B               | B               |
| 3.1.2.23 | press button READ and verify on the command status window     | Command execute | Command execute |
| 3.1.2.24 | Verify MODE window  | OK              | OK              |
| 3.1.2.25 | Verify Version window   | PDS PROM        | PDS PROM        |
| 3.1.2.26 | Select Select TX = B  | 26-Jan-09 17:06 | 26-Jan-09 17:06 |
| 3.1.2.27 | Select RX = B   | POWER ON 0      | POWER ON 0      |

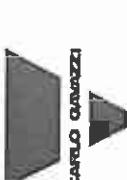
### 10.3.1.2.2 CAN BUS COMMUNICATION LINE CHECK BOARD 31

| Step     | Description   | USCM selected   | USCM selected   |
|----------|---|-----------------|-----------------|
| 3.1.2.28 | Objective: To verify the external CAN BUS lines communication | 31              | 31              |
| 3.1.2.29 | Set the CAN BUS board address to 31 in the command widow      | 0               | 0               |
| 3.1.2.30 | Select JMDC = 0   | A               | A               |
| 3.1.2.31 | Select TX = A   | A               | A               |
| 3.1.2.32 | Select RX = A   | A               | A               |
| 3.1.2.33 | press button READ and verify on the command status window     | Command execute | Command execute |
| 3.1.2.34 | Verify MODE window  | OK              | OK              |
| 3.1.2.35 | Verify Version window   | PDS PROM        | PDS PROM        |
| 3.1.2.36 | Verify History window   | 26-Jan-09 17:06 | 26-Jan-09 17:06 |
| 3.1.2.37 | Select Select TX = B  | POWER ON 0      | POWER ON 0      |
| 3.1.2.38 | Select RX = B   | B               | B               |

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|--|---|--|---------------------------|
| <p>AMSO2-PDS PFM FULL FUNCTIONAL TEST REPORT</p>   |   |  |                           |
| <p>TEST PROCEDURE REFERENCE</p>  |   | <p>TEST REPORT REFERENCE</p>   |                           |
| UUT DATA:  | Model   | Item   | S/N                       |
|  | PFM   | AMSO2 POWER DISTRIBUTION SYSTEM  | FM01                      |
| STEP n°  | TEST SEQUENCE   | C.I.   | MEASURED VALUE            |
|  |   | EXPECTED VALUE   | REMARKS                   |
| 3.1.2.39   | press button READ and verify on the command status window   | Command execute OK   | Command execute OK        |
| 3.1.2.40   | Verify MODE window  | PDS PROM   | PDS PROM                  |
| 3.1.2.41   | Verify Version window   | 26-Jan-09 17:06  | 26-Jan-09 17:06           |
| 3.1.2.42   | Verify History  | POWER ON 0   | POWER ON 0                |
| <h3>10.3.1.2.3 PDS INTERNAL SERIAL COMMUNICATION CHECK BOARD 30</h3>   |   |  |                           |
| 3.1.2.43   | Objective: To verify the internal communication of the CAN BUS boards 30 with the PDS A side boards |  |                           |
| 3.1.2.44   | set the CAN BUS board address to 30   | 30   | 30                        |
| 3.1.2.45   | select JMDC = 0   | 0  | 0                         |
| 3.1.2.46   | select TX = A   | A  | A                         |
| 3.1.2.47   | select RX = A   | A  | A                         |
| 3.1.2.48   | Press button "RUN Flash" and verify on the command status window                                    | Command execute OK   | Command execute OK        |
| 3.1.2.49   | press button READ and verify on the command status window   | Command execute OK   | Command execute OK        |
| 3.1.2.50   | Verify MODE window  | PDS FLASH  | PDS FLASH                 |
| 3.1.2.51   | Verify Version window   | 26-Jan-09 17:07  | 26-Jan-09 17:07           |
| 3.1.2.52   | Verify History  | PROM 3   | PROM 3                    |
| 3.1.2.53   | Select PDS controller software  | program open   | program open              |
| 3.1.2.54   | set the CAN BUS board address to 30   | 30   | 30                        |
| 3.1.2.55   | select JMDC = 0   | 0  | 0                         |
| 3.1.2.56   | select TX = A   | A  | A                         |
| 3.1.2.57   | select RX = A   | A  | A                         |
| 3.1.2.58   | Select "CAN BUS I/F Side" to A  | A  | A                         |
| 3.1.2.59   | Select "PDS Side" to A  | A  | A                         |
| 3.1.2.60   | Press button "READ INPUT" button and verify on the command status window                            | Command execute OK   | Command execute OK        |
| 3.1.2.61   | Verify Input Stage A Voltage (V) monitor  | 120V ± 9.5V  | 119,6V                    |
| 3.1.2.62   | Verify Input stage A Current (A) monitor  | 1,1A ± 20%   | 0,723 A                   |
| 3.1.2.63   | Press button "READ" to verify all board status  | Command execute OK   | 20% Full Scale value      |
| 3.1.2.64   | Verify "Sta" column values  | All boards OK  | OK                        |
| DATE: 10/06/09   | TEST CONDUCTOR <i>Francesco</i>   | QA <i>Francesco</i>  | CUSTOMER <i>Francesco</i> |

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|  | AMS02-PDS PFM FULL FUNCTIONAL TEST REPORT  |  |  |
| <b>UUT DATA :</b>  | <b>Model</b>   | <b>PFM</b>   | <b>Item</b>  |
|  |  |  | AMS02 POWER DISTRIBUTION SYSTEM  |
| <b>STEP n°</b>   | <b>TEST SEQUENCE</b>   |  |  |
| 3.1.2.65   | Verify "OVT" column values   |  |  |
| 3.1.2.66   | Verify "Temp" column values  |  |  |
| 3.1.2.67   | Verify "Ref" column values   |  |  |
| <b>STEP n°</b>   | <b>TEST SEQUENCE</b>   | <b>C.I.</b>  | <b>PDS 18</b>  |
|  |  | <b>EXPECTED VALUE</b>  | <b>MEASURED VALUE</b>  |
| 3.1.2.65   | All boards   | OK   | OK   |
| 3.1.2.66   | -20°C to +80°C   | OK   | OK   |
| 3.1.2.67   | 2,5V ± 0,25V<br>2,0V ± 0,25V<br>3,0V ± 0,25V<br>4,0V ± 0,25V | 2,50V<br>2,17V<br>3,01V<br>2,19V<br>2,96V<br>2,15V<br>3,00V<br>2,21V<br>2,99V<br>4,03V | With the exception of ESEM1-A board: OVT flag not present<br>No full scale values must be present<br>All temperatures must be inside unit temp limits<br>All |

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|   |                      | <b>TEST PROCEDURE REFERENCE</b>  |  | <b>TEST REPORT REFERENCE</b>   |                |
| <b>UUT DATA :</b>   | <b>Model</b>         | <b>Item</b>  | <b>AMS02 POWER DISTRIBUTION SYSTEM</b> | <b>C.I.</b>  | <b>PDS 18</b>  |
|   |                      |  |  |  | <b>SIN</b>     |
| <b>STEP n°</b>  | <b>TEST SEQUENCE</b> |  |  |  | <b>REMARKS</b> |
|   |                      |  | <b>EXPECTED VALUE</b>                  | <b>MEASURED VALUE</b>  |                |
|   |                      |  |  |  | <b>FM01</b>    |

10.3.1.2.4 PDS INTERNAL SERIAL COMMUNICATION CHECK BOARD 31

|          |  |                 |                 |                 |  |  |
|----------|--|-----------------|-----------------|-----------------|--|--|
| 3.1.2.68 | Select USCM controller software  |                 |                 |                 |  |  |
| 3.1.2.69 | Set the CAN BUS board address to 31                                      |                 |                 |                 |  |  |
| 3.1.2.70 | select JMDC = 0  |                 |                 |                 |  |  |
| 3.1.2.71 | select TX = A  |                 |                 |                 |  |  |
| 3.1.2.72 | select RX = A  |                 |                 |                 |  |  |
| 3.1.2.73 | Press button "RUN Flash" and verify on the command status window         |                 |                 |                 |  |  |
| 3.1.2.74 | press button READ and verify on the command status window                |                 |                 |                 |  |  |
| 3.1.2.75 | Verify MODE window   | PDS FLASH       | PDS FLASH       |                 |  |  |
| 3.1.2.76 | Verify Version window  | 26-Jan-09 17:07 | 26-Jan-09 17:07 |                 |  |  |
| 3.1.2.77 | Verify History   | PROM 3          | PROM 3          |                 |  |  |
| 3.1.2.78 | Select PDS controller software   |                 | program open    | program open    |  |  |
| 3.1.2.79 | Set the CAN BUS board address to 31                                      |                 | 31              | 31              |  |  |
| 3.1.2.80 | select JMDC = 0  |                 | 0               | 0               |  |  |
| 3.1.2.81 | select TX = A  |                 | A               | A               |  |  |
| 3.1.2.82 | select RX = A  |                 | A               | A               |  |  |
| 3.1.2.83 | Select "CAN BUS I/F Side" to B   |                 | B               | B               |  |  |
| 3.1.2.84 | Select "PDS Side" to A   |                 | A               | A               |  |  |
| 3.1.2.85 | Click on Run Flash button  |                 | OK              | OK              |  |  |
| 3.1.2.86 | Press button "READ INPUT" button and verify on the command status window |                 | Command execute | Command execute |  |  |
| 3.1.2.87 | Verify "Input Stage A" Voltage (V) monitor                               | 120V ± 9.5V     | 119.2V          |                 |  |  |
| 3.1.2.88 | Verify "Input stage A" Current (A) monitor                               | 1.1A ± 20%      | 1.0A            |                 |  |  |
| 3.1.2.89 | Press button "READ" to verify all board status                           | Command execute | Command execute |                 |  |  |
| 3.1.2.90 | Verify "Sta" column values   | All boards OK   | OK              |                 |  |  |
| 3.1.2.91 | Verify "OVT" column values   | All boards OK   | OK              |                 |  |  |
| 3.1.2.92 | Verify "Temp" column values  | -20°C to +80°C  | OK              |                 |  |  |

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|-------------------------|----------------------------|---|---------------------------------------|--|
| CARLO GAVAZZI SPACE SpA |                            | AMS02-PDS PFM FULL FUNCTIONAL TEST REPORT |                                       | Ediz.: 2 Data: 10/06/2009<br>Issue: Pagina 35 di 370   |
| UUT DATA :              |                            | Model: PFM                                | Item: AMS02 POWER DISTRIBUTION SYSTEM | C.I. PDS 18 TEST PROCEDURE REFERENCE   |
| STEP n°                 | TEST SEQUENCE              |   |                                       | EXPECTED VALUE   |
| 3.1.2.93                | Verify "Ref" column values |   |                                       | 2,5V ± 0,25V<br>2,0V ± 0,25V<br>3,0V ± 0,25V<br>4,0V ± 0,25V |
| 3.1.2.94                | Switch OFF 120V main bus   |   |                                       | OK   |
|                         |                            |   |                                       | 2,49V<br>2,23V<br>3,02V<br>2,21V<br>3,00V<br>2,18V<br>2,97V<br>2,19V<br>2,94V<br>4,00V   |
|                         |                            |   |                                       | OK   |

### 10.3.1.2.5 CAN BUS BOARDS CROSS CMD OFF/ON AND SUICIDE TEST

|           |  |                                 |                           |   |
|-----------|--|---------------------------------|---------------------------|---|
| 3.1.2.95  | Objective: to verify the possibility to command OFF and ON one board from the other      |                                 |                           |   |
| 3.1.2.96  | Verify that the "power switch box" is connected between power supply alim and PDS cables | Connected<br>OFF                | Connected<br>OFF          |   |
| 3.1.2.97  | Verify that the "power switch" of the "power switch box" is set in OFF position          | Program open<br>File open       | Program open<br>File open |   |
| 3.1.2.98  | Lunch the PDS controller software  | File open                       | File open                 |   |
| 3.1.2.99  | Launch the USCM controller software  | FM<br>FM                        | FM<br>FM                  |   |
| 3.1.2.100 | Set to "FM" the window Model   | OK                              | OK                        |   |
| 3.1.2.101 | Connect "J300 test box" to the unit J300 connector                                       | J100 connected<br>120,00V±1,00V | J100 connected<br>120V    | V1  |
| 3.1.2.102 | Connect min power supply between AI_120V (positive) and AI_120V RTN (negative)           | 3A±0,5A                         | 3A                        |   |
| 3.1.2.103 | Set Power supply alim to 120V  | enabled                         | OK                        |   |
| 3.1.2.104 | Set output current limitation to 3A  | Green led lighted<br>Switch ON  | OK                        |   |
| 3.1.2.105 | Enable power supply output   | Red led lighted                 | OK                        |   |
| 3.1.2.106 | Verify that green led of "power switch box" is lighted                                   | Green led lighted               | OK                        |   |
| 3.1.2.107 | Switch ON the "power switch" of "power switch box"                                       | Switch ON                       | OK                        |   |
| 3.1.2.108 | Verify that red led of "power switch box" is lighted                                     | Red led lighted                 | OK                        |   |
| 3.1.2.109 | Verify the current absorption from Main Bus  | 1,10A±0,20A                     | 1,1A                      | Note: this current can be read from power supply display or amperometer. In case of power supply reading, verify the correctness of measurements. |
| 3.1.2.110 | Select USCM controller software  | USCM selected                   | USCM selected             |   |
| 3.1.2.111 | set the CAN BUS board address to 30 in the command window                                | 30                              | 30                        |   |
| 3.1.2.112 | Select JMDC = 0  | 0                               | 0                         |   |
| 3.1.2.113 | Select TX = A  | A                               | A                         |   |
| DATE:     | 10.06.09   | TEST CONDUCTOR                  | QA                        | CUSTOMER  |

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| AMSO2-PDS  |   |                           | N° Doc: PDS-PR-CGS-006<br>Doc N°: 2<br>Ediz.: 1<br>Issue: Pagina 36 di 370 | N° Doc: PDS-RP-CGS-072<br>Doc N°: 1<br>Ediz.: 1<br>Issue: Pagina 36 di 370 |
|------------|---|---------------------------|--|--|
| UUT DATA : | Model   | Item                      | TEST PROCEDURE REFERENCE   | TEST REPORT REFERENCE  |
| STEP n°    | TEST SEQUENCE   | C.I.                      | SIN  | FM01   |
| 3.1.2.114  | Select RX = A   | A                         | A  | A  |
| 3.1.2.115  | press button READ and verify on the command status window   | Command execute<br>OK     | Command execute<br>OK  |  |
| 3.1.2.116  | Verify MODE window  | PDS PROM                  | PDS PROM   |  |
| 3.1.2.117  | Verify Version window   | 26-Jan-09 17:06           | 26-Jan-09 17:06  |  |
| 3.1.2.118  | Verify History window   | POWER ON 0                | POWER ON 0   |  |
| 3.1.2.119  | Measure the CAN BUS internal power supply: connect a multimeter between PIN Vcc (positive) and SEC_GND (negative) on side A of the J300 test box    | 5.3V ± 0.1V               | 5.30V  |  |
| 3.1.2.120  | Set the CAN BUS board address to 31 in the command window   | 31                        | 31   |  |
| 3.1.2.121  | Select JMDC = 0   | 0                         | 0  |  |
| 3.1.2.122  | Select TX = A   | A                         | A  |  |
| 3.1.2.123  | Select RX = A   | A                         | A  |  |
| 3.1.2.124  | press button READ and verify on the command status window   | Command execute<br>OK     | Command execute<br>OK  |  |
| 3.1.2.125  | Verify MODE window  | PDS PROM                  | PDS PROM   |  |
| 3.1.2.126  | Verify Version window   | 26-Jan-09 17:06           | 26-Jan-09 17:06  |  |
| 3.1.2.127  | Verify History window   | POWER ON 0                | POWER ON 0   |  |
| 3.1.2.128  | Measure the CAN BUS internal power supply: connect a multimeter between PIN Vcc (positive) and SEC_GND (negative) on side B of the J300 test box    | 5.30 ± 0.1V               | 5.29V  |  |
| 3.1.2.129  | set the CAN BUS board address to 30 in the command window   | 30                        | 30   |  |
| 3.1.2.130  | press button SOFF and verify on the command status window   | Command execute<br>OK     | Command execute<br>OK  |  |
| 3.1.2.131  | Set the CAN BUS board address to 31 in the command window   | 31                        | 31   |  |
| 3.1.2.132  | press button READ and verify on the command status window   | Command execute<br>failed | Command execute<br>failed  |  |
| 3.1.2.133  | Measure the CAN BUS 31 internal power supply: connect a multimeter between PIN Vcc (positive) and SEC_GND (negative) on side B of the J300 test box | 0.5V ± 0.1V               | 0,51V  |  |
| 3.1.2.134  | Measure the CAN BUS 30 internal power supply: connect a multimeter between PIN Vcc (positive) and SEC_GND (negative) on side A of the J300 test box | 5.3V ± 0.1V               | 5,30V  |  |
| 3.1.2.135  | set the CAN BUS board address to 30 in the command window   | 30                        | 30   |  |
| 3.1.2.136  | press button SON and verify on the command status window  | Command execute<br>OK     | Command execute<br>OK  |  |
| 3.1.2.137  | Set the CAN BUS board address to 31 in the command window   | 31                        | 31   |  |
| 3.1.2.138  | press button READ and verify on the command status window   | Command execute<br>OK     | Command execute<br>OK  |  |
| 3.1.2.139  | Measure the CAN BUS internal power supply: connect a multimeter between PIN Vcc (positive) and SEC_GND (negative) on side B of the J300 test box    | 5.3V ± 0.1V               | 5,28V  |  |

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| <br>CARLO GAVAZZI | <b>AMSO2-PDS</b>   |     |      | N° Doc:<br>Doc N°:<br>Ediz.:<br>Issue: | <b>PDS-PR-CGS-006</b>     | N° Doc:<br>Doc N°:<br>Ediz.:<br>Issue: | <b>PDS-RP-CGS-072</b> |
|--|--|-----|------|--|---------------------------|--|-----------------------|
|  | AMSO2-PDS PFM FULL FUNCTIONAL TEST REPORT  |     |      | Date:<br>Date:<br>Page                 | 10/06/2009<br>di<br>370   | Date:<br>Date:<br>Page                 | 1<br>di<br>370        |
| UUT DATA :   | Model  | PFM | Item | AMSO2 POWER DISTRIBUTION SYSTEM        | C.I.                      | TEST PROCEDURE REFERENCE               | TEST REPORT REFERENCE |
| STEP n°  | TEST SEQUENCE  |     |      | EXPECTED VALUE                         | MEASURED VALUE            | REMARKS                                |                       |
| 3.1.2.140  | Verify MODE window   |     |      | PDS PROM                               | PDS PROM                  |  |                       |
| 3.1.2.141  | Verify Version window  |     |      | 26-Jan-09 17:06                        | 26-Jan-09 17:06           |  |                       |
| 3.1.2.142  | Verify History window  |     |      | POWER ON 0                             | POWER ON 0                |  |                       |
| 3.1.2.143  | Set the CAN BUS board address to 31 in the command window  |     |      | 31                                     | 31                        |  |                       |
| 3.1.2.144  | press button SOFF and verify on the command status window  |     |      | Command execute<br>OK                  | Command execute<br>OK     |  |                       |
| 3.1.2.145  | set the CAN BUS board address to 30 in the command window  |     |      | 30                                     | 30                        |  |                       |
| 3.1.2.146  | press button READ and verify on the command status window  |     |      | Command execute<br>Failed              | Command execute<br>Failed |  |                       |
| 3.1.2.147  | Measure the CAN BUS internal power supply: connect a multimeter between PIN Vcc (positive) and SEC GND (negative) on side A of the J300 test box |     |      | 0,5V ± 0,1V                            | 0,51V                     |  |                       |
| 3.1.2.148  | Measure the CAN BUS internal power supply: connect a multimeter between PIN Vcc (positive) and SEC GND (negative) on side B of the J300 test box |     |      | 5,3V ± 0,1V                            | 5,28V                     |  |                       |
| 3.1.2.149  | Set the CAN BUS board address to 31 in the command window  |     |      | 31                                     | 31                        |  |                       |
| 3.1.2.150  | press button SON and verify on the command status window   |     |      | Command execute<br>OK                  | Command execute<br>OK     |  |                       |
| 3.1.2.151  | set the CAN BUS board address to 30 in the command window  |     |      | 30                                     | 30                        |  |                       |
| 3.1.2.152  | press button READ and verify on the command status window  |     |      | Command execute<br>OK                  | Command execute<br>OK     |  |                       |
| 3.1.2.153  | Measure the CAN BUS internal power supply: connect a multimeter between PIN Vcc (positive) and SEC GND (negative) on side A of the J300 test box |     |      | 5,3V ± 0,1V                            | 5,30V                     |  |                       |
| 3.1.2.154  | Verify MODE window   |     |      | PDS PROM                               | PDS PROM                  |  |                       |
| 3.1.2.155  | Verify Version window  |     |      | 26-Jan-09 17:06                        | 26-Jan-09 17:06           |  |                       |
| 3.1.2.156  | Verify History window  |     |      | POWER ON 0                             | POWER ON 0                |  |                       |
| 3.1.2.157  | SUICIDE BOARD 30 COMMAND TEST  |     |      |  |                           |  |                       |
| 3.1.2.158  | set the CAN BUS board address to 30 in the command window  |     |      | 30                                     | 30                        |  |                       |
| 3.1.2.159  | press button SUIC and verify on the command status window  |     |      | Command execute<br>Failed              | Command execute<br>Failed |  |                       |
| 3.1.2.160  | Measure the CAN BUS internal power supply: connect a multimeter between PIN Vcc (positive) and SEC GND (negative) on side A of the J300 test box |     |      | 0,50V ± 0,1V                           | 0,51V                     |  |                       |
| 3.1.2.161  | press button READ and verify on the command status window  |     |      | Command execute<br>Failed              | Command execute<br>Failed |  |                       |
| 3.1.2.162  | Set the CAN BUS board address to 31 in the command window  |     |      | 31                                     | 31                        |  |                       |
| 3.1.2.163  | press button SON and verify on the command status window   |     |      | Command execute<br>OK                  | Command execute<br>OK     |  |                       |
| 3.1.2.164  | set the CAN BUS board address to 30 in the command window  |     |      | 30                                     | 30                        |  |                       |

DATE: **10.06.09** TEST CONDUCTOR **et 2010** QA **✓** CUSTOMER

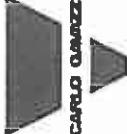
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| CARLO GAVAZZI           |   | AMS02-PDS                                 |     | N° Doc:<br>Doc N°:<br>Ediz.:<br>Issue: | PDS-PR-CGS-006<br>2<br>Data: 10/06/2009 | N° Doc:<br>Doc N°:<br>Ediz.:<br>Issue: | PDS-RP-CGS-072<br>1<br>Data: 27/06/2009 |
|-------------------------|---|---|-----|--|---|--|---|
| CARLO GAVAZZI SPACE SPA |   | AMS02-PDS PFM FULL FUNCTIONAL TEST REPORT |     | Pagina<br>Page                         | 38 di 370                               | Pagina<br>Page                         | 38 di 370                               |
| UUT DATA :              |   | Model                                     | PFM | Item                                   | AMS02 POWER DISTRIBUTION SYSTEM         | C.I.                                   | TEST PROCEDURE REFERENCE                |
| STEP n°                 | TEST SEQUENCE   |   |     |  | EXPECTED<br>VALUE                       | MEASURED<br>VALUE                      | REMARKS                                 |
| 3.1.2.165               | press button READ and verify on the command status window   |   |     |  | Command execute<br>OK                   | Command execute<br>OK                  |   |
| 3.1.2.166               | Measure the CAN BUS internal power supply: connect a multimeter between PIN Vcc (positive) and SEC_GND (negative) on side 30 of the J300 test box |   |     |  | 5.30 ± 0.1V                             | 5.30V                                  |   |
| 3.1.2.167               | Verify MODE window  |   |     |  | PDS_PROM                                | PDS_PROM                               |   |
| 3.1.2.168               | Verify Version window   |   |     |  | 26-Jan-09 17:06                         | 26-Jan-09 17:06                        |   |
| 3.1.2.169               | Verify History window   |   |     |  | POWER ON 0                              | POWER ON 0                             |   |
| 3.1.2.170               | SUICIDE BOARD 31 COMMAND TEST   |   |     |  |   |  |   |
| 3.1.2.171               | Set the CAN BUS board address to 31 in the command window   |   |     |  | 31                                      | 31                                     |   |
| 3.1.2.172               | press button SUIC and verify on the command status window   |   |     |  | Command execute<br>failed               | Command execute<br>failed              |   |
| 3.1.2.173               | Measure the CAN BUS internal power supply: connect a multimeter between PIN Vcc (positive) and SEC_GND (negative) on side B of the J300 test box  |   |     |  | 0.50V ± 0.1V                            | 0.51V                                  |   |
| 3.1.2.174               | press button READ and verify on the command status window   |   |     |  | Command execute<br>failed               | Command execute<br>failed              |   |
| 3.1.2.175               | set the CAN BUS board address to 30 in the command window   |   |     |  | 30                                      | 30                                     |   |
| 3.1.2.176               | press button SON and verify on the command status window  |   |     |  | Command execute<br>OK                   | Command execute<br>OK                  |   |
| 3.1.2.177               | Set the CAN BUS board address to 31 in the command window   |   |     |  | 31                                      | 31                                     |   |
| 3.1.2.178               | press button READ and verify on the command status window   |   |     |  | Command execute<br>OK                   | Command execute<br>OK                  |   |
| 3.1.2.179               | Measure the CAN BUS internal power supply: connect a multimeter between PIN Vcc (positive) and SEC_GND (negative) on side B of the J300 test box  |   |     |  | 5.30V ± 0.1V                            | 5.28V                                  |   |
| 3.1.2.180               | Verify MODE window  |   |     |  | PDS_PROM                                | PDS_PROM                               |   |
| 3.1.2.181               | Verify Version window   |   |     |  | 26-Jan-09 17:06                         | 26-Jan-09 17:06                        |   |
| 3.1.2.182               | Verify History window   |   |     |  | POWER ON 0                              | POWER ON 0                             |   |
| 3.1.2.183               | Switch OFF the "power switch" of "power switch box"   |   |     |  | OFF                                     | OFF                                    |   |
| 3.1.2.184               | Disable power supply output   |   |     |  | DISABLED                                | DISABLED                               |   |

### 10.3.1.3 POWER VIDEO GRAPPLER FIXTURE 1 POWER SUPPLY VERIFICATION (1P)

|                |   |               |           |          |
|----------------|---|---------------|-----------|----------|
| 3.1.2.185      | Connect main power supply between 1P_120V (positive) and 1P_120V_RTN (negative) | CONNECTED     | CONNECTED |          |
| 3.1.2.186      | Connect ESEM 3-B outlet 1 to load   | CONNECTED     | CONNECTED |          |
| 3.1.2.187      | Set Power supply alim to 120V   | 120.00V±100mV | 120.00V   |          |
| 3.1.2.188      | Set output current limitation to 5A   | 5A±0.5A       | 5.0A      |          |
| 3.1.2.189      | Enable power supply output  | Enabled       | Enabled   |          |
| DATE: 10.06.09 | TEST CONDUCTOR <i>QA 20/0</i>   | QA            | <i>QA</i> | CUSTOMER |

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|---|--|---|------|--|-----------------------|--|--|
|  <p><b>CARLO GAVAZZI</b></p> |  | <h1 style="text-align: center;"><b>AMS02-PDS</b></h1> |      | N° Doc:<br>Doc N°:<br>Ediz.:<br>Issue: | <b>PDS-PR-CGS-006</b> | N° Doc:<br>Doc N°:<br>Ediz.:<br>Issue: | <b>PDS-RP-CGS-072</b>                            |
| AMS02-PDS PFM FULL FUNCTIONAL TEST REPORT<br><br>CARLO GAVAZZI SPACE SpA  |  | Pagina 39 di 370                                      |      | Data:<br>Date:<br>Page                 | 10/06/2009            | Data:<br>Date:<br>Page                 | 1 39 di 370                                      |
|   |  |   |      | TEST PROCEDURE REFERENCE               | TEST REPORT REFERENCE | TEST REPORT REFERENCE                  | TEST REPORT REFERENCE                            |
| UUT DATA :  | Model  | PFM   | Item | AMS02 POWER DISTRIBUTION SYSTEM        | C.I.                  | PDS 18                                 | S/N  |
| STEP n°   | TEST SEQUENCE  |   |      |  | EXPECTED VALUE        | MEASURED VALUE                         | REMARKS  |
| 3.1.2.190   | Verify that green led of "power switch box" is lighted   |   |      | Green led lighted                      | Green led lighted     |  |  |
| 3.1.2.191   | Switch ON the "power switch "of "power switch box"   |   |      | Switch ON                              | Switch ON             |  |  |
| 3.1.2.192   | Verify that red led of "power switch box" is lighted   |   |      | Red led lighted                        | Red led lighted       |  |  |
| 3.1.2.193   | Measure the PDS input voltage; connect a multimeter between PIN "bypass thermal interlock" (positive) and "PRI GND"(negative) on side A of the J300 test box |   |      | 118,50V±1,00V                          | 118,8V                |  |  |
| 3.1.2.194   | Verify the current absorption from Main Bus  |   |      | 2,30A±0,20A                            | 2,30A                 |  |  |
| 3.1.2.195   | Select PDS controller software   |   |      | OPEN                                   | OPEN                  |  |  |
| 3.1.2.196   | Set to "FM" the window Model   |   |      | FM                                     | FM                    |  |  |
| 3.1.2.197   | Set the CAN BUS board address to 30  |   |      | 30                                     | 30                    |  |  |
| 3.1.2.198   | Select "CAN BUS IF Side" to A  |   |      | A                                      | A                     |  |  |
| 3.1.2.199   | Select "PDS Side" to A   |   |      | A                                      | A                     |  |  |
| 3.1.2.200   | select JMDC = 0  |   |      | 0                                      | 0                     |  |  |
| 3.1.2.201   | select TX = A  |   |      | A                                      | A                     |  |  |
| 3.1.2.202   | select RX = A  |   |      | A                                      | A                     |  |  |
| 3.1.2.203   | Press button "RUN Flash" and verify on the command status window   |   |      | Command execute OK                     | Command execute OK    |  |  |
| 3.1.2.204   | Press button "READ" to verify all board status   |   |      | Command execute OK                     | Command execute OK    |  |  |
| 3.1.2.205   | Verify the status of the flags indicated on "Sta" column. All flags must be "OK"   |   |      | OK                                     | OK                    |  |  |
| 3.1.2.206   | Set the CAN BUS board address to 31  |   |      | 31                                     | 31                    |  |  |
| 3.1.2.207   | Select "CAN BUS IF Side" to B  |   |      | B                                      | B                     |  |  |
| 3.1.2.208   | Select "PDS Side" to A   |   |      | A                                      | A                     |  |  |
| 3.1.2.209   | Click on Run flash button  |   |      | Command execute OK                     | Command execute OK    | Command located on up-left             |  |
| 3.1.2.210   | Press button "READ" to verify all board status   |   |      | Command execute OK                     | Command execute OK    |  |  |
| 3.1.2.211   | Verify the status of the flags indicated on "Sta" column. All flags must be "OK"   |   |      | OK                                     | OK                    | Click on READ command under Sta column | This column resumes the status of all the boards |
| 3.1.2.212   | Measure with multimeter the voltage on ESEM 3-B outlet 1   |   |      | 117,00V<V<120,00V                      | 118,3V                |  |  |
| 3.1.2.213   | Switch OFF main power bus  |   |      | OK                                     | OK                    |  |  |
| 3.1.2.214   | disconnect ESEM 3-B outlet 1 to default load   |   |      | OK                                     | OK                    |  |  |
| DATE:   | 10.06.09   | TEST CONDUCTOR  | QA   |  |                       |  | CUSTOMER   |

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| <br><b>CARLO GAVAZZI</b> | <h1><b>AMS02-PDS</b></h1>                 |            |
|   | AMS02-PDS PFM FULL FUNCTIONAL TEST REPORT |            |
| <b>UUT DATA :</b>   | <b>Model</b>                              | <b>PFM</b> |
| <b>STEP n°</b>  | <b>TEST SEQUENCE</b>                      |            |

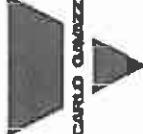
### 10.3.1.4 TO POWER SUPPLY TEST

| N° Doc:<br>Doc N°:<br>Ediz.:<br>Issue:<br>Pagina<br>Page | <b>PDS-PR-CGS-006</b>   |                                  | N° Doc:<br>Doc N°:<br>Ediz.:<br>Issue:<br>Pagina<br>Page | <b>PDS-RP-CGS-072</b>  |   |
|--|---|----------------------------------|--|------------------------|---|
|  | 2   | Date:<br>10/06/2009<br>di<br>370 |  | 1                      | Date:<br>27/06/2009<br>di<br>370  |
|  |   |                                  | TEST PROCEDURE REFERENCE                                 |                        | TEST REPORT REFERENCE   |
| STEP n°  | Item  | AMS02 POWER DISTRIBUTION SYSTEM  | C.I.   | PDS 18                 | S/N<br>FM01   |
| TEST SEQUENCE  |   |                                  | EXPECTED<br>VALUE  | MEASURED<br>VALUE      | REMARKS   |
| 3.1.2.215  | Connect main power supply between T0_120V (positive) and T0_120V_RTN (negative)   |                                  | Connected<br>CONNECTED                                   | Connected<br>CONNECTED | Default on: current absorption N = 1.200A at 100mA  |
| 3.1.2.216  | Connect ESEM 3-B outlet 1 to load   |                                  | 120.00V±1.00V<br>5A±0.5A                                 | 120.00V<br>5.0A        |   |
| 3.1.2.217  | Set Power supply aim to 120V  |                                  |  |                        |   |
| 3.1.2.218  | Set output current limitation to 5A   |                                  |  |                        |   |
| 3.1.2.219  | Enable power supply output  |                                  | Enabled  | Enabled                |   |
| 3.1.2.220  | Verify that green led of "power switch box" is lighted  |                                  | Green led lighted  | Green led lighted      |   |
| 3.1.2.221  | Switch ON the "power switch "of "power switch box"  |                                  | Switch ON  | Switch ON              |   |
| 3.1.2.222  | Verify that red led of "power switch box" is lighted  |                                  | Red led lighted  | Red led lighted        |   |
| 3.1.2.223  | Measure the PDS Input voltage: connect a multimeter between PIN "bypass thermal interlock" (positive) and "PRI_GND" (negative) on side A of the J300 test box |                                  | 118,50V±1.00V  | 119,5V                 |   |
| 3.1.2.224  | Verify the current absorption from Main Bus   |                                  | 2,30A±0,20A  | 2,30A                  |   |
| 3.1.2.225  | Select PDS controller software  |                                  | OPEN<br>FM   | OPEN<br>FM             |   |
| 3.1.2.226  | Set to "FM" the window Model  |                                  | 30   | 30                     |   |
| 3.1.2.227  | Set the CAN BUS board address to 30   |                                  | A  | A                      |   |
| 3.1.2.228  | Select "CAN BUS I/F Side" to A  |                                  | A  | A                      |   |
| 3.1.2.229  | Select "PDS Side" to A  |                                  | 0  | 0                      |   |
| 3.1.2.230  | select JMDC = 0   |                                  | A  | A                      |   |
| 3.1.2.231  | select TX = A   |                                  | A  | A                      |   |
| 3.1.2.232  | select RX = A   |                                  | A  | A                      |   |
| 3.1.2.233  | Press button "RUN Flash" and verify on the command status window  |                                  | Command execute<br>OK                                    | Command execute<br>OK  |   |
| 3.1.2.234  | Press button "READ" to verify all board status  |                                  | Command execute<br>OK                                    | Command execute<br>OK  | Click on READ command under Sta column<br>This column resumes the status of all the boards      |
| 3.1.2.235  | Verify the status of the flags indicated on "Sta" column. All flags must be "OK"  |                                  | OK   | OK                     |   |
| 3.1.2.236  | Set the CAN BUS board address to 31   |                                  | 31   | 31                     |   |
| 3.1.2.237  | Select "CAN BUS I/F Side" to B  |                                  | B  | B                      |   |
| 3.1.2.238  | Select "PDS Side" to A  |                                  | A  | A                      |   |
| 3.1.2.239  | Click on Run flash button   |                                  | Command execute<br>OK                                    | Command execute<br>OK  | Command located on up-left  |
| 3.1.2.240  | Press button "READ" to verify all board status  |                                  | Command execute<br>OK                                    | Command execute<br>OK  |   |
| DATE:  | 14.06.09  | TEST CONDUCTOR                   | PAOLO, c   | QA                     | CUSTOMER<br> |

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| <b>AMSO2-PDS</b>                          |  | N° Doc: PDS-PR-CGS-006<br>Doc N°: 10/06/2009<br>Ediz.: 2 Data: 10/06/2009<br>Issue: Pagina 41 di 370<br>Pagina Page 41 di 370<br>of of |      | N° Doc: PDS-RP-CGS-072<br>Doc N°: 1 Date: 27/06/2009<br>Ediz.: 1 Issue: Pagina 41 di 370<br>Page of of |                      |                       |  |      |
|---|--|--|------|--|----------------------|-----------------------|--|------|
| AMS02-PDS PFM FULL FUNCTIONAL TEST REPORT |  | TEST PROCEDURE REFERENCE   |      |  |                      | TEST REPORT REFERENCE |  |      |
| UUT DATA :                                | Model  | PFM  | Item | AMSO2 POWER DISTRIBUTION SYSTEM  | C.I.                 | PDS 18                | SIN  | FM01 |
| STEP n°                                   | TEST SEQUENCE  |  |      |  | EXPECTED VALUE       | MEASURED VALUE        | REMARKS  |      |
| 3.1.2.241                                 | Verify the status of the flags indicated on "Sta" column. All flags must be "OK" |  |      |  | OK                   | OK                    | Click on READ command under Sta column<br>This column resumes the status of all the boards |      |
| 3.1.2.242                                 | Measure with multimeter the voltage on ESEM 3-B outlet 1                         |  |      |  | 1117,000V<v<120,000V | 118,4V                | This test is used to verify that input diode located in input stage board is not damaged   |      |
| 3.1.2.243                                 | Switch OFF main power bus  |  |      |  | OK                   | OK                    |  |      |
| 3.1.2.244                                 | Disconnect ESEM 3-B outlet 1 to default load                                     |  |      |  | OK                   | OK                    |  |      |

DATE: 10/06/09 TEST CONDUCTOR *PF 2010* QA *PF* CUSTOMER *PF*

|   |                  |  |
|---|------------------|--|
|  | <b>AMS02-PDS</b> |  |
| AMS02-PDS PFM FULL FUNCTIONAL TEST REPORT   |                  | N° Doc: PDS-PR-CGS-006<br>Doc N°: PDS-RP-CGS-072<br>Ediz.: 2 Data: 10/06/2009<br>Issue: Pagina 42 di 370<br>Page |
| UUT DATA :  | Model PFM        | Item AMS02 POWER DISTRIBUTION SYSTEM C.I.  |
| STEP n°   | TEST SEQUENCE    | TEST PROCEDURE REFERENCE<br>S/N FM01   |

### 10.3.1.5 UNIT CHECK

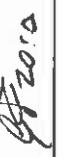
| 3.1.5.1  | Connect AI 120V and AI 120V RTTN power supply signals            | Connected             | Connected             |
|----------|--|-----------------------|-----------------------|
| 3.1.5.2  | Verify that all the cables of the section are connected          | OK                    | OK                    |
| 3.1.5.3  | Launch the PDS controller software                               | Program open          | Program open          |
| 3.1.5.4  | Set to "FM" the window Model                                     | OK                    | OK                    |
| 3.1.5.5  | Select "PDS Side" to A   | A                     | A                     |
| 3.1.5.6  | Set the CAN BUS board address to 30                              | 30                    | 30                    |
| 3.1.5.7  | Select JMDIC = 0   | 0                     | 0                     |
| 3.1.5.8  | Select TX = A  | A                     | A                     |
| 3.1.5.9  | Select RX = A  | A                     | A                     |
| 3.1.5.10 | Select "CAN BUS I/F Side" to A                                   | A                     | A                     |
| 3.1.5.11 | Set input bus voltage to 120V                                    | 120V±1V               | 120.0V                |
| 3.1.5.12 | Set input bus current limitation to 27,5 A                       | 27,5 A±1A             | 27,5 A                |
| 3.1.5.13 | Enable power supply output                                       | Enabled               | Enabled               |
| 3.1.5.14 | Verify that green led of "power switch box" is lighted           | Green led lighted     | Green led lighted     |
| 3.1.5.15 | Switch ON the "power switch "of "power switch box"               | Switch ON             | Switch ON             |
| 3.1.5.16 | Verify that red led of "power switch box" is lighted             | Red led lighted       | Red led lighted       |
| 3.1.5.17 | Take note of power supply output current                         | 1,1A±0,5A             | 1,1A                  |
| 3.1.5.18 | Press button 'RUN Flash' and verify on the command status window | Command execute<br>OK | Command execute<br>OK |

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CUSTOMER 

|   |  |
|---|--|
|  | <b>AMS02-PDS</b>                               |
| CARLO GAVAZZI SPACE SPA   | AMS02-PDS PFM FULL FUNCTIONAL TEST REPORT      |
| UUT DATA :  | Model PFM Item AMS02 POWER DISTRIBUTION SYSTEM |
| STEP n°   | TEST SEQUENCE                                  |

### 10.3.1.5.1 INPUT STAGE A VERIFICATION

| N° Doc:<br>Doc N°:<br>Ediz.:<br>Issue:<br>Page | PDS-PR-CGS-006<br>2<br>Data:<br>Date:<br>43<br>di<br>370                        | N° Doc:<br>Doc N°:<br>Ediz.:<br>Issue:<br>Page | PDS-RP-CGS-072<br>1<br>Data:<br>Date:<br>43<br>di<br>370 |
|--|---|--|--|
| TEST PROCEDURE REFERENCE                       |   | TEST REPORT REFERENCE                          |  |
| STEP n°  | TEST SEQUENCE   | C.I.   | S/N  |
|  |   | EXPECTED VALUE                                 | MEASURED VALUE   |
|  |   |  | REMARKS  |
| 3.1.5.19                                       | Push the command "Read input" located in the bottom left of the software window | OK   | OK   |
| 3.1.5.20                                       | Take note of the value "V" indicated in Input Stage A window                    | V1±9,50V                                       | 119,7V   |
| 3.1.5.21                                       | Take note of the value "I" indicated in Input Stage A window                    | I1±1,65A                                       | 0,617A   |
| 3.1.5.22                                       | Set the CAN BUS board address to 31   | 31   | 31   |
| 3.1.5.23                                       | Select "CAN BUS I/F Side" to B  | B  | B  |
| 3.1.5.24                                       | Press button 'RUN Flash' and verify on the command status window                | Command execute<br>OK                          | Command execute<br>OK                                    |
| 3.1.5.25                                       | Push the command "Read input" located in the bottom left of the software window | OK   | OK   |
| 3.1.5.26                                       | Take note of the value "V" indicated in Input Stage A window                    | V1±9,50V                                       | 122,1V   |
| 3.1.5.27                                       | Take note of the value "I" indicated in Input Stage A window                    | I1±1,65A                                       | 0,90A  |
| 3.1.5.28                                       | Switch OFF main power bus   | OFF  | OFF  |
| 3.1.5.29                                       | Connect external heaters  | Connected                                      | Connected  |
| 3.1.5.30                                       | Switch ON main bus  | ON   | ON   |
| 3.1.5.31                                       | Verify the current absorption from Main Bus                                     | 7,80±0,50A                                     | 7,8A   |
| 3.1.5.32                                       | Switch OFF main power bus   | OFF  | OFF  |
| 3.1.5.33                                       | Disconnect external heaters   | Disconnected                                   | Disconnected   |

|  |  |  |  |
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| DATE: 10.06.09   | TEST CONDUCTOR  | QA  | CUSTOMER  |
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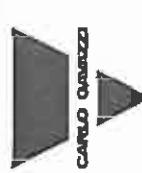
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|---|------------------|------|
|  | <b>AMS02-PDS</b> |      |
| CARLO GAVAZZI SPACE SpA   |                  |      |
| AMS02-PDS PFM FULL FUNCTIONAL TEST REPORT   |                  |      |
| UUT DATA:   | Model            | Item |
| STEP n°   | TEST SEQUENCE    |      |

### 10.3.1.5.2 ESEM 1-A SIDE A

| Nº Doc:<br>Doc N°:<br>Ediz.:<br>Issue:<br>Pagina<br>Page | PDS-PR-CGS-006   |                            | Nº Doc:<br>Doc N°:<br>Ediz.:<br>Issue:<br>Pagina<br>Page | PDS-RP-CGS-072    |                            |
|--|--|----------------------------|--|-------------------|----------------------------|
|  | 2  | Data:<br>Date:<br>di<br>of |  | 1                 | Data:<br>Date:<br>di<br>of |
|  |  |                            | TEST PROCEDURE REFERENCE                                 |                   | TEST REPORT REFERENCE      |
| STEP n°  | TEST SEQUENCE  |                            | C.I.   | PDS 18            | S/N                        |
|  |  |                            |  | EXPECTED<br>VALUE | MEASURED<br>VALUE          |
|  |  |                            |  |                   | REMARKS                    |
| 1A-A.1   | Set input bus voltage to 120V  |                            |  | 120V±1V           | 120V                       |
| 1A-A.2   | Set input bus current limitation to 27.5 A   |                            |  | 27.5A             | 27.5A                      |
| 1A-A.3   | Switch ON main bus   |                            |  | ON                | ON                         |
| 1A-A.4   | Take note of power supply output current   |                            |  | 1,1A±0,5A         | 1,1A                       |
| 1A-A.5   | Set the CAN BUS board address to 30  |                            |  | 30                | 30                         |
| 1A-A.6   | Select "CAN BUS I/F Side" to A   |                            |  | A                 | A                          |
| 1A-A.7   | Press button "RUN Flash" and verify on the command status window                       |                            | Command execute  | Command execute   |                            |
| 1A-A.8   | Click on ESEM 1-A button   |                            | OK   | OK                |                            |
| 1A-A.9   | Set Digital I/F Test logic value = 1 in "Commanding" column                            |                            | OK   | OK                |                            |
| 1A-A.10  | Click on letter "W" on the right of the "1" value                                      |                            | OK   | OK                |                            |
| 1A-A.11  | Click on the command READ ALL under the column Digital Readout                         |                            | OK   | OK                |                            |
| 1A-A.12  | Verify that in the column Digital Readout under the voice Digital I/F Test appears "1" |                            | 1  | 1                 |                            |
| 1A-A.13  | Set Digital I/F Test logic value = 0 in "Commanding" column                            |                            | 0  | 0                 |                            |
| 1A-A.14  | Click on letter "W" on the right of the "0" value                                      |                            | OK   | OK                |                            |
| 1A-A.15  | Click on the command READ ALL under the column Digital Readout                         |                            | OK   | OK                |                            |
| 1A-A.16  | Verify that in the column Digital Readout under the voice Digital I/F Test appears "0" |                            | 0  | 0                 |                            |
| Verify the status of the following flags:                |  |                            |  |                   |                            |
| BOARD STATUS   |  |                            |  | OK                | OK                         |
| DCDC 1 OVC   |  |                            |  | OK                | OK                         |
| DCDC 2 OVC   |  |                            |  | OK                | OK                         |
| DCDC 1 STATUS  |  |                            |  | ON                | ON                         |
| DCDC 2 STATUS  |  |                            |  | ON                | ON                         |
| MAIN POWER STATUS  |  |                            |  | ON                | ON                         |
| 1A-A.17  | Click on PB2-1 button  |                            | OK   | OK                |                            |
| 1A-A.18  | Set to "ON" the line "DCDC OFF/ON CMD" in the "commanding" column                      |                            | ON   | ON                |                            |
| 1A-A.19  | Set to "ON" the line "DCDC OFF/ON CMD" in the "commanding" column                      |                            | ON   | ON                |                            |
| 1A-A.20  | Press "W" button" in the line "DCDC OFF/ON CMD" in the "commanding" column             |                            | ON   | ON                |                            |
| 1A-A.21  | Verify that in the column Digital Readout under the voice DCDC ON/OFF appears "ON"     |                            | ON   | ON                |                            |
| 1A-A.22  | Click on PB2-2 button  |                            | OK   | OK                |                            |
| 1A-A.23  | Set to "ON" the line "DCDC OFF/ON CMD" in the "commanding" column                      |                            | ON   | ON                |                            |
| 1A-A.24  | Press "W" button" in the line "DCDC OFF/ON CMD" in the "commanding" column             |                            | ON   | ON                |                            |
| 1A-A.25  | Verify that in the column Digital Readout under the voice DCDC ON/OFF appears "ON"     |                            | ON   | ON                |                            |

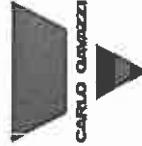
|                       |                               |                   |                         |
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| DATE: <b>10.06.09</b> | TEST CONDUCTOR <b>PF 2010</b> | QA <b>PF 2010</b> | CUSTOMER <b>PF 2010</b> |
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|  <b>AMS02-PDS</b><br><b>CARLO GAVAZZI SPACE SpA</b>   |  | N° Doc: PDS-RP-CGS-006<br>Doc N°: 2<br>Ediz.: Date: 10/06/2009<br>Issue: Date: 27/06/2009<br>Page: Pagina 45 di 370 |      | N° Doc: PDS-RP-CGS-072<br>Doc N°: 1<br>Ediz.: Issue:<br>Page: Pagina 45 di 370      |                       |
| AMS02-PDS PFM FULL FUNCTIONAL TEST REPORT  |  |   |      |   | TEST REPORT REFERENCE |
| UUT DATA :   | Model  | PFM   | Item | AMS02 POWER DISTRIBUTION SYSTEM   | C.I. PDS 16           |
| S/N  | TEST SEQUENCE  |   |      | EXPECTED VALUE  | MEASURED VALUE        |
| STEP n'  |  |   |      | REMARKS   |                       |
| 1A-A.26  | Click on PB2-3 button  |   |      | OK  | OK                    |
| 1A-A.27  | Set to "ON" the line "DCDC OFF/ON CMD" in the "commanding" column                  |   |      | OK  | ON                    |
| 1A-A.28  | Press "V" button in the line "DCDC OFF/ON CMD" in the "commanding" column          |   |      | Command execute   | Command execute       |
| 1A-A.29  | Verify that in the column Digital Readout under the voice DCDC ON/OFF appears "ON" |   |      | OK  | OK                    |
| 1A-A.30  | Click on PB2-4 button  |   |      | OK  | ON                    |
| 1A-A.31  | Set to "ON" the line "DCDC OFF/ON CMD" in the "commanding" column                  |   |      | OK  | OK                    |
| 1A-A.32  | Press "V" button in the line "DCDC OFF/ON CMD" in the "commanding" column          |   |      | Command execute   | Command execute       |
| 1A-A.33  | Verify that in the column Digital Readout under the voice DCDC ON/OFF appears "ON" |   |      | OK  | ON                    |
| 1A-A.34  | Take note of power supply output current   |   |      | ON  | ON                    |
|  |  |   |      | 1,6A±0,5A   | 1,6A                  |
|  |  |   |      | All the PB2 DC/DC are ON  |                       |
| TEST REPORT REFERENCE  |  |   |      |   |                       |
| S/N FM01   |  |   |      |   |                       |
| 10.3.1.5.2.1 ESEM 1-A SIDE A UNDER VOLTAGE TEST  |  |   |      |   |                       |
| 1A-A.35  | Click on ESEM 1-A button   |   |      | OK  | OK                    |
| 1A-A.36  | Press "READ ALL" button in the column "ANALOG READOUT"                             |   |      | Command execute   | Command execute       |
| 1A-A.37  | Verify the "Analog ref. 4,0V" telemetry  |   |      | OK  | OK                    |
| 1A-A.38  | Measure the input voltage with a multimeter  |   |      | 4,0V ± 0,15V  | 4,02V                 |
| 1A-A.39  | In the column "ANALOG READOUT" press R Button near Main Power Volt.                |   |      | 120V ± 0,2V   | 120,2V                |
| 1A-A.40  | Decrease the input voltage to 113V   |   |      | 120V ± 4,5V   | 120,2V                |
| 1A-A.41  | In the column "ANALOG READOUT" press R Button near Main Power Volt.                |   |      | 113V ± 0,2V   | 113,2V                |
| 1A-A.42  | Decrease the input voltage to 85V (below threshold and accuracy)                   |   |      | 113V ± 4,5V   | 114,1V                |
| 1A-A.43  | Verify current absorption from Main Bus  |   |      | 85V ± 0,2V  | 85,2V                 |
| 1A-A.44  | In the column "ANALOG READOUT" press R Button near Main Power Volt.                |   |      | 0,000A±200mA  | 0,1A                  |
| 1A-A.45  | Set the CAN BUS board address to 31  |   |      | Command execute   | Command execute       |
| 1A-A.46  | Select "CAN BUS I/F Side" to B   |   |      | Failed  | Failed                |
| 1A-A.47  | In the column "ANALOG READOUT" press R Button near Main Power Volt.                |   |      | B   | B                     |
| 1A-A.48  | Increase the input voltage to 113V   |   |      | Command execute   | Command execute       |
| 1A-A.49  | Take note of power supply output current   |   |      | Failed  | Failed                |
| 1A-A.50  | Set power supply to 120V   |   |      | 113V ± 0,2V   | 113,2V                |
| 1A-A.51  | Take note of power supply output current   |   |      | 1,34±0,5A   | 1,5A                  |
| 1A-A.52  | Press button "RUN Flash" and verify on the command status window                   |   |      | 120V ± 0,2V   | 120,2V                |
|  |  |   |      | 1,1A±0,5A   | 1,2A                  |
|  |  |   |      | Command execute   | Command execute       |
|  |  |   |      | OK  | OK                    |
| DATE:  | 10.06.09   | TEST CONDUCTOR  | QA   | CUSTOMER  |                       |
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| CARLO GAVAZZI   |  | <b>AMS02-PDS</b>                          |      |                                 | N° Doc:<br>Doc N°:<br>Ediz.:<br>Issue:<br>Page | PDS-PR-CGS-006<br>2<br>Data: 10/06/2009<br>di 370<br>of 370 | N° Doc:<br>Doc N°:<br>Ediz.:<br>Issue:<br>Page | PDS-RP-CGS-072<br>1<br>Data: 27/06/2009<br>di 46<br>of 46 |
|---|--|---|------|---------------------------------|--|---|--|---|
| CARLO GAVAZZI SPACE SPA                               |  | AMS02-PDS PFM FULL FUNCTIONAL TEST REPORT |      |                                 | TEST PROCEDURE REFERENCE                       |   | TEST REPORT REFERENCE                          |   |
| UUT DATA :  | Model  | PFM                                       | Item | AMS02 POWER DISTRIBUTION SYSTEM | C.I.   | PDS 18  | S/N  | FM01  |
| STEP n°   | TEST SEQUENCE  |   |      |                                 | EXPECTED VALUE                                 | MEASURED VALUE  | REMARKS  |   |
| 1A-A.53   | Set the CAN BUS board address to 30  |   |      |                                 | 30   | 30  | 30   |   |
| 1A-A.54   | Select "CAN BUS I/F Side" to A   |   |      |                                 | A  | A   | A  |   |
| 1A-A.55   | Press button "RUN Flash" and verify on the command status window                   |   |      |                                 | Command execute OK                             | Command execute OK  | OK   |   |
| 1A-A.56   | Click on ESEM1-A button  |   |      |                                 | OK   | OK  | OK   |   |
| 1A-A.57   | Press "READ ALL" button in the column "DIGITAL READOUT"                            |   |      |                                 | Command execute OK                             | Command execute OK  | OK   |   |
|   | Verify the following parameter:  |   |      |                                 |  |   |  |   |
| 1A-A.58   | Board status   |   |      |                                 | 0 (OK)   | 0 (OK)  | 0 (OK)   |   |
|   | DCDC 1 OVC   |   |      |                                 | 0 (OK)   | 0 (OK)  | 0 (OK)   |   |
|   | DCDC 2 OVC   |   |      |                                 | 0 (OK)   | 0 (OK)  | 0 (OK)   |   |
|   | DCDC 1 STATUS  |   |      |                                 | 1 (ON)   | 1 (ON)  | 1 (ON)   |   |
|   | DCDC 2 STATUS  |   |      |                                 | 1 (ON)   | 1 (ON)  | 1 (ON)   |   |
|   | MAIN POWER STATUS  |   |      |                                 | 1 (ON)   | 1 (ON)  | 1 (ON)   |   |
| 1A-A.59   | Click on Read All command in the column Analog Readout                             |   |      |                                 | OK   | OK  | OK   |   |
|   | Verify the value of the following telemetries:                                     |   |      |                                 |  |   |  |   |
| 1A-A.60   | Temperature  |   |      |                                 | -40°C < T < 80°C                               | 33,30°C   | 33,30°C  |   |
|   | Main Power Volt.   |   |      |                                 | 120,00V ± 7,50V                                | 121,4V  | 121,4V   |   |
|   | Analog Ref: 4,0V   |   |      |                                 | 4,0000V ± 150mV                                | 4,05V   | 4,05V  |   |
| <b>10.3.1.5.2.2 ESEM 1-A SIDE A OVER VOLTAGE TEST</b> |  |   |      |                                 |  |   |  |   |
| 1A-A.61   | Click on PB2-1 button  |   |      |                                 | OK   | OK  | OK   |   |
| 1A-A.62   | Set to "ON" the line "DCDC OFF/ON CMD" in the "commanding" column                  |   |      |                                 | ON   | ON  | ON   |   |
| 1A-A.63   | Press "W" button in the line "DCDC OFF/ON CMD" in the "commanding" column          |   |      |                                 | W  | W   | W  |   |
| 1A-A.64   | Verify that in the column Digital Readout under the voice DCDC ON/OFF appears "ON" |   |      |                                 | ON   | ON  | ON   |   |
| 1A-A.65   | Click on PB2-2 button  |   |      |                                 | OK   | OK  | OK   |   |
| 1A-A.66   | Set to "ON" the line "DCDC OFF/ON CMD" in the "commanding" column                  |   |      |                                 | ON   | ON  | ON   |   |
| 1A-A.67   | Press "W" button in the line "DCDC OFF/ON CMD" in the "commanding" column          |   |      |                                 | W  | W   | W  |   |
| 1A-A.68   | Verify that in the column Digital Readout under the voice DCDC ON/OFF appears "ON" |   |      |                                 | ON   | ON  | ON   |   |
| 1A-A.69   | Click on PB2-3 button  |   |      |                                 | OK   | OK  | OK   |   |
| 1A-A.70   | Set to "ON" the line "DCDC OFF/ON CMD" in the "commanding" column                  |   |      |                                 | ON   | ON  | ON   |   |
| 1A-A.71   | Press "W" button in the line "DCDC OFF/ON CMD" in the "commanding" column          |   |      |                                 | W  | W   | W  |   |
| 1A-A.72   | Verify that in the column Digital Readout under the voice DCDC ON/OFF appears "ON" |   |      |                                 | ON   | ON  | ON   |   |
| 1A-A.73   | Click on PB2-4 button  |   |      |                                 | OK   | OK  | OK   |   |
| 1A-A.74   | Set to "ON" the line "DCDC OFF/ON CMD" in the "commanding" column                  |   |      |                                 | ON   | ON  | ON   |   |
| DATE: 10.06.09  | TEST CONDUCTOR <i>g. z. 2010</i>   |   |      | QA                              |  |   | CUSTOMER <i>g. z. 2010</i>                     |   |

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|  <p><b>AMS02-PDS</b></p> <p>CARLO GAVAZZI SPACE SpA</p> |  | <p>N° Doc:<br/>Doc N°:<br/>Ediz.:<br/>Issue:</p> <p>PDS-PR-CGS-006<br/>2<br/>Data:<br/>Date:<br/>10/06/2009</p> <p>N° Doc:<br/>Doc N°:<br/>Ediz.:<br/>Issue:</p> <p>PDS-RP-CGS-072<br/>1<br/>Data:<br/>Date:<br/>27/06/2009</p> |                          |
|--|--|---|--------------------------|
| <p>AMS02-PDS PFM FULL FUNCTIONAL TEST REPORT</p>   |  | <p>Pagina 47 di 370</p>   |                          |
| UUT DATA :   | Model  | Item  | TEST PROCEDURE REFERENCE |
|  | PFM  | AMS02 POWER DISTRIBUTION SYSTEM   | C.I. PDS 18              |
| STEP n°  | TEST SEQUENCE  |   | S/N FM01                 |
| STEP n°  | TEST SEQUENCE  | EXPECTED VALUE  | MEASURED VALUE           |
| 1A-A.75  | Press "V" button in the line "DCDC OFF/ON CMD" in the "commanding" column          | V   | V                        |
| 1A-A.76  | Verify that in the column Digital Readout under the voice DCDC ON/OFF appears "ON" | ON  | ON                       |
| 1A-A.77  | Take note of power supply output current   | 1,6A±0,5A   | 1,6 A                    |
| 1A-A.78  | Increase the input voltage to 126V   | 126V ± 0,2V   | 126,2V                   |
| 1A-A.79  | Click on ESEM1-A button  | OK  | OK                       |
| 1A-A.80  | In the column "ANALOG READOUT" press R Button near Main Power Volt                 | 126V ± 4,5V   | 128,0V                   |
| 1A-A.81  | Increase the input voltage to 130V   | 130V ± 0,2V   | 129,8V                   |
| 1A-A.82  | In the column "ANALOG READOUT" press R Button near Main Power Volt.                | 130V ± 4,5V   | 131,2V                   |
| 1A-A.83  | Set the input voltage to 153V (up the threshold and accuracy)                      | 153V ± 0,2V   | 153,2V                   |
| 1A-A.84  | Verify current absorption from Main Bus  | 0,0000±200mA  | 0,2 A                    |
| 1A-A.85  | In the column "ANALOG READOUT" press R Button near Main Power Volt.                | Command execute Failed  | Command execute Failed   |
| 1A-A.86  | Set the CAN BUS board address to 31  | 31  | 31                       |
| 1A-A.87  | Select "CAN BUS I/F Side" to B   | B   | B                        |
| 1A-A.88  | In the column "ANALOG READOUT" press R Button near Main Power Volt.                | Command execute Failed  | Command execute Failed   |
| 1A-A.89  | Set the input voltage to 126V  | 126V ± 0,2V   | 126,2V                   |
| 1A-A.90  | Take note of power supply output current   | 1,0A±0,5A   | 1,2 A                    |
| 1A-A.91  | Press button "RUN Flash" and verify on the command status window                   | OK  | OK                       |
| 1A-A.92  | Set power supply to 120V   | 120V ± 0,2V   | 120,2V                   |
| 1A-A.93  | Take note of power supply output current   | 1,1A±0,5A   | 1,2 A                    |
| 1A-A.94  | Set the CAN BUS board address to 30  | 30  | 30                       |
| 1A-A.95  | Select "CAN BUS I/F Side" to A   | A   | A                        |
| 1A-A.96  | Press button "RUN Flash" and verify on the command status window                   | OK  | Command execute OK       |
| 1A-A.97  | Click on ESEM1-A button  | OK  | OK                       |
| 1A-A.98  | Press "READ ALL" button in the column "DIGITAL READOUT"                            | OK  | OK                       |
| 1A-A.99  | Verify the following parameter:  |   |                          |
| 1A-A.100   | Board status   | 0 (OK)  | 0 (OK)                   |
| 1A-A.101   | DCDC 1 OVC   | 0 (OK)  | 0 (OK)                   |
| 1A-A.102   | DCDC 2 OVC   | 0 (OK)  | 0 (OK)                   |
| 1A-A.103   | DCDC 1 STATUS  | 1 (ON)  | 1 (ON)                   |
| 1A-A.104   | DCDC 2 STATUS  | 1 (ON)  | 1 (ON)                   |
| 1A-A.105   | MAIN POWER STATUS  | 1 (ON)  | 1 (ON)                   |
| 1A-A.106   | Verify the value of the following telemetries:                                     |   |                          |
| DATE: 10. 06. 09   | TEST CONDUCTOR <i>G. Prolo</i>   | QA <i>ZZ</i>  | CUSTOMER                 |

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| <br><b>CARLO GAVAZZI</b><br><br><b>CARLO GAVAZZI SPACE SpA</b> | <h1 style="margin: 0;">AMS02-PDS</h1> <p style="margin: 0;">AMS02-PDS PFM FULL FUNCTIONAL TEST REPORT</p> | N° Doc:<br>Doc N°:<br>Ediz.:<br>Issue:<br>Data:<br>Date:<br><b>PDS-PR-CGS-006</b><br><b>2</b><br><b>10/06/2009</b><br><b>Pagina 48 di 370</b><br>TEST PROCEDURE REFERENCE | N° Doc:<br>Doc N°:<br>Ediz.:<br>Issue:<br>Data:<br>Date:<br><b>PDS-RP-CGS-072</b><br><b>1</b><br><b>27/06/2009</b><br><b>Pagina 48 di 370</b><br>TEST REPORT REFERENCE |
|--|---|---|--|
| <b>UUT DATA :</b><br><b>Model</b> PFM <b>Item</b> AMS02 POWER DISTRIBUTION SYSTEM <b>C.I.</b> PDS 18   | <b>S/N</b> FM01   |   |  |
| STEP n°  | TEST SEQUENCE   | EXPECTED VALUE  | MEASURED VALUE   |
|  | Temperature<br>Main Power Volt.<br>Analog Ref. 4.0V   | -40°C< T<80°C<br>120,00V±7.50V<br>4,000V±150mV  | 32.65°C<br>119.6V<br>4.06V   |

### 10.3.1.5.2.3 ESEM 1-A SIDE A GLOBAL ON/OFF TEST

|          |  |                           |                           |
|----------|--|---------------------------|---------------------------|
| 1A-A-107 | Set OFF in the Global ON/OFF window and click on relative "W" command  | OFF                       | OFF                       |
| 1A-A-108 | Verify current absorption from Main Bus  | 0,0000±200mA              | 0,2A                      |
| 1A-A-109 | Press "READ ALL" button in the column "DIGITAL READOUT"  | OK                        | OK                        |
| 1A-A-110 | Verify that appears the message "Command execution failed!"  | Command execution failed! | Command execution failed! |
| 1A-A-111 | Perform a power cycle OFF/ON on the main bus   | OK                        | OK                        |
| 1A-A-112 | Click on Run flash button  | OK                        | OK                        |
| 1A-A-113 | Click on Read all command under Digital Readout column and verify that appears the message "Command executed O.K." | Command executed          | Command executed          |
| 1A-A-114 | Verify that the value of Board status in Digital Readout column in "OK"  | OK                        | OK                        |
| 1A-A-115 | Set the CAN BUS board address to 31  | 31                        | 31                        |
| 1A-A-116 | Select "CAN BUS I/F Side" to B   | B                         | B                         |
| 1A-A-117 | Click on Run flash button  | OK                        | OK                        |
| 1A-A-118 | Click on Read all command under Digital Readout column and verify that appears the message "Command executed O.K." | Command executed          | Command executed          |
| 1A-A-119 | Verify that the value of Board status in Digital Readout column in "OK"  | OK                        | OK                        |
| 1A-A-120 | Set OFF in the Global ON/OFF window and click on relative "W" command  | OK                        | OK                        |
| 1A-A-121 | Verify current absorption from Main Bus  | 0,0000±200mA              | 0A                        |
| 1A-A-122 | Press "READ ALL" button in the column "DIGITAL READOUT"  | OK                        | OK                        |
| 1A-A-123 | Verify that appears the message "Command execution failed!"  | Command execution failed! | Command execution failed! |
| 1A-A-124 | Perform a power cycle OFF/ON on the main bus   | OK                        | OK                        |
| 1A-A-125 | Set the CAN BUS board address to 30  | 30                        | 30                        |
| 1A-A-126 | Select "CAN BUS I/F Side" to A   | A                         | A                         |
| 1A-A-127 | Click on Run flash button  | OK                        | OK                        |
| 1A-A-128 | Click on Read all command under Digital Readout column and verify that appears the message "Command executed O.K." | Command executed          | Command executed          |
| 1A-A-129 | Verify that the value of Board status in Digital Readout column in "OK"  | OK                        | OK                        |
| 1A-A-130 | Switch OFF main power bus  | OFF                       | OFF                       |

|  |                         |    |          |
|--|-------------------------|----|----------|
| DATE: 10.06.09   | TEST CONDUCTOR 9 Feb 10 | QA | CUSTOMER |
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|---|---|------------|--|
| <br><b>CARLO GAVAZZI</b><br><b>CARLO GAVAZZI SPACE SpA</b> | <h1 style="text-align: center;"><b>AMS02-PDS</b></h1> |            |  |
|   | <b>AMS02-PDS PFM FULL FUNCTIONAL TEST REPORT</b>      |            |  |
| <b>UUT DATA :</b>   | <b>Model</b>  | <b>PFM</b> | <b>Item</b>                            |
|   |   |            | <b>AMS02 POWER DISTRIBUTION SYSTEM</b> |

### 10.3.1.5.3 PB2-1 SIDE A

| <b>STEP n°</b> | <b>TEST SEQUENCE</b>   | <b>ITEM</b>    | <b>TEST PROCEDURE REFERENCE</b> | <b>TEST REPORT REFERENCE</b> |                   |  |
|----------------|--|----------------|---------------------------------|------------------------------|-------------------|--|
|                |  |                |                                 | <b>C.I.</b>                  | <b>PDS 18</b>     | <b>S/N</b>                                     |
|                |  |                |                                 |                              |                   |  |
| PB2-1-A.1      | Connect AI 120V and AI 120V RTN power supply signals                                   |                |                                 | OK                           | OK                | OK   |
| PB2-1-A.2      | Verify that all the cables of the section are connected                                |                |                                 | OK                           | OK                | OK   |
| PB2-1-A.3      | Launch the PDS controller software   |                |                                 | Program open                 | Program open      |  |
| PB2-1-A.4      | Set to "FM" the window Model   |                |                                 | FM                           | FM                |  |
| PB2-1-A.5      | set the CAN BUS board address to 30  |                |                                 | 30                           | 30                |  |
| PB2-1-A.6      | select JMDc = 0  |                |                                 | 0                            | 0                 |  |
| PB2-1-A.7      | select TX = A  |                |                                 | A                            | A                 | A  |
| PB2-1-A.8      | select RX = A  |                |                                 | A                            | A                 | A  |
| PB2-1-A.9      | Select "CAN BUS I/F Side" to A   |                |                                 | A                            | A                 | A  |
| PB2-1-A.10     | Select "PDS Side" to A   |                |                                 | A                            | A                 | A  |
| PB2-1-A.11     | Set input bus voltage to 120V  |                |                                 | 120V±1V                      | 120V              |  |
| PB2-1-A.12     | Set input bus current limitation to 27.5 A   |                |                                 | 27.5A                        | 27.5 A            |  |
| PB2-1-A.13     | Enable power supply output   |                |                                 | enabled                      | Enabled           |  |
| PB2-1-A.14     | Verify that green led of "power switch box" is lighted                                 |                |                                 | Green led lighted            | Green led lighted |  |
| PB2-1-A.15     | Switch ON the "power switch " of "power switch box"                                    |                |                                 | Switch ON                    | Switch ON         |  |
| PB2-1-A.16     | Verify that red led of "power switch box" is lighted                                   |                |                                 | Red led lighted              | Red led lighted   |  |
| PB2-1-A.17     | Take note of power supply output current   |                |                                 | 1,1A±0,5A                    | 1,0A              |  |
| PB2-1-A.18     | Click on Run flash button  |                |                                 | OK                           | OK                |  |
| PB2-1-A.19     | Set the CAN BUS board address to 31  |                |                                 | 31                           | 31                |  |
| PB2-1-A.20     | Select "CAN BUS I/F Side" to B   |                |                                 | B                            | B                 |  |
| PB2-1-A.21     | Click on Run flash button  |                |                                 | OK                           | OK                |  |
| PB2-1-A.22     | Set the CAN BUS board address to 30  |                |                                 | 30                           | 30                |  |
| PB2-1-A.23     | Select "CAN BUS I/F Side" to A   |                |                                 | A                            | A                 |  |
| PB2-1-A.24     | Click on PB2-1 button  |                |                                 | OK                           | OK                | This board is default ON                       |
| PB2-1-A.25     | Set Digital I/F Test logic value = 1 in "Commanding" column                            |                |                                 | 1                            | 1                 | Button located on left side of software window |
| PB2-1-A.26     | Click on letter "W" on the right of the "1" value                                      |                |                                 | OK                           | OK                |  |
| PB2-1-A.27     | Click on the command READ ALL under the column Digital Readout                         |                |                                 | OK                           | OK                |  |
| PB2-1-A.28     | Verify that in the column Digital Readout under the voice Digital I/F Test appears "1" |                |                                 | 1                            | 1                 |  |
| PB2-1-A.29     | Set Digital I/F Test logic value = 0 in "Commanding" column                            |                |                                 | 0                            | 0                 |  |
| PB2-1-A.30     | Click on letter "W" on the right of the "0" value                                      |                |                                 | OK                           | OK                |  |
| PB2-1-A.31     | Click on the command READ ALL under the column Digital Readout                         |                |                                 | OK                           | OK                |  |
| PB2-1-A.32     | Verify that in the column Digital Readout under the voice Digital I/F Test appears "0" |                |                                 | 0                            | 0                 |  |
| PB2-1-A.33     | Verify the status of the following flags:<br>BOARD STATUS                              |                |                                 | OK                           | OK                |  |
| DATE:          | 10.06.09   | TEST CONDUCTOR | QA                              |                              |                   | CUSTOMER                                       |

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| CARLO GAVAZZI           |  | AMS02-PDS                                 |      | N° Doc:<br>Doc N°:<br>Ediz.:<br>Issue: | PDS-PR-CGS-006<br>Data:<br>2<br>Date:<br>10/06/2009<br>Pagina<br>Page<br>50<br>di<br>370 | N° Doc:<br>Doc N°:<br>Ediz.:<br>Issue:<br>Pagina<br>Page<br>50<br>di<br>370 | PDS-RP-CGS-072<br>Data:<br>1<br>Date:<br>27/06/2009 |
|-------------------------|--|---|------|--|--|---|---|
| CARLO GAVAZZI SPACE SpA |  | AMS02-PDS PFM FULL FUNCTIONAL TEST REPORT |      | TEST PROCEDURE REFERENCE               |  | TEST REPORT REFERENCE   |   |
| UUT DATA :              | Model  | PFM                                       | Item | AMS02 POWER DISTRIBUTION SYSTEM        | C.I.   | PDS 18  | S/N   |
| STEP n°                 | TEST SEQUENCE  |   |      | EXPECTED<br>VALUE                      | MEASURED<br>VALUE  | REMARKS   |   |
|                         | OVT ALARM  |   |      | OK                                     | OK   | OK  |   |
|                         | Input OVC Alarm  |   |      | OK                                     | OK   | OK  |   |
|                         | DCDC ON/OFF  |   |      | ON                                     | ON   | ON  |   |
|                         | 27V UV   |   |      | OK                                     | OK   | OK  |   |
|                         | 29V Trip   |   |      | OK                                     | OK   | OK  |   |
|                         | DCDC OFF/ON CMD  |   |      | ON                                     | ON   | ON  |   |
| PB2-1-A-34              | Measure with multimeter the voltage on ESEM 3A-1 out 3 (Check that load is not connected)  |   |      | 28,00V±1,00V                           | 28,15V   | V1  |   |
| PB2-1-A-35              | Verify the value of the following telemetry:<br>Output Voltage                             |   |      | V1±1,092V                              | 28,04V   | Click on relative Rbutton<br>Power cell OFF                                 |   |
| PB2-1-A-36              | Set OFF on DCDC ON/OFF command window and send the command                                 |   |      | OK                                     | OK   |   |   |
| PB2-1-A-37              | Click on the command READ ALL under the column Digital Readout                             |   |      | OK                                     | OK   |   |   |
|                         | Verify the status of the following flags:<br>BOARD STATUS                                  |   |      | OK                                     | OK   |   |   |
| PB2-1-A-38              | OVT ALARM  |   |      | OK                                     | OK   |   |   |
|                         | Input OVC Alarm  |   |      | OK                                     | OK   |   |   |
|                         | DCDC ON/OFF  |   |      | OFF                                    | OFF  |   |   |
|                         | 27V UNV  |   |      | OK                                     | OK   |   |   |
|                         | 29V Trip   |   |      | OFF                                    | OFF  |   |   |
|                         | DCDC OFF/ON CMD  |   |      | OK                                     | OK   |   |   |
| PB2-1-A-39              | Click on the command READ ALL under the column Analog Readout                              |   |      | -40°C<T<80°C                           | 33,9°C   |   |   |
|                         | Verify the value of the following telemetries:<br>Temperature<br>Analog Ref. 2,0V          |   |      | 2,0000V±150mV                          | 2,01V  |   |   |
| PB2-1-A-40              | Verify the following analog monitor:<br>Output Voltage                                     |   |      | 0,00V±1,092V                           | -0,07V   | Click on relative Rbutton   |   |
| PB2-1-A-41              |  |   |      | 0,00V±1,092V                           | -0,07V   |   |   |
| PB2-1-A-42              | Measure with multimeter the voltage on ESEM 3-A 1 out 3 (Check that load is not connected) |   |      | 0,00V±0,10V                            | 0,00V  |   |   |
| PB2-1-A-43              | Set the CAN BUS board address to 31  |   |      | 31                                     | 31   |   |   |
| PB2-1-A-44              | Select "CAN BUS I/F Side" to B   |   |      | B                                      | B  |   |   |
| PB2-1-A-45              | Click on the command READ ALL under the column Digital Readout                             |   |      | OK                                     | OK   |   |   |
|                         | Verify the status of the following flags:<br>BOARD STATUS                                  |   |      | OK                                     | OK   |   |   |
| PB2-1-A-46              | OVT ALARM  |   |      | OK                                     | OK   |   |   |
|                         | Input OVC Alarm  |   |      | OK                                     | OK   |   |   |
|                         | DCDC ON/OFF  |   |      | OFF                                    | OFF  |   |   |
|                         | 27V UNV  |   |      | OK                                     | OK   |   |   |
|                         | 29V Trip   |   |      | OFF                                    | OFF  |   |   |
|                         | DCDC OFF/ON CMD  |   |      | OK                                     | OK   |   |   |
| DATE: (O. 06.09         | TEST CONDUCTOR   | QA  |      |  |  |   | CUSTOMER  |
|                         |  |   |      |  |  |   |   |

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| CARLO GAVAZZI                             |  | AMS02-PDS                                 |      | N° Doc:<br>Doc N°:<br>Ediz.:<br>Issue:<br>Pagina<br>Page | PDS-PR-CGS-006<br>Data:<br>Date:<br>51 di 370 | N° Doc:<br>Doc N°:<br>Ediz.:<br>Issue:<br>Pagina<br>Page | PDS-RP-CGS-072<br>Data:<br>Date:<br>51 di 370 |  |  |
|---|--|---|------|--|---|--|---|--|--|
| CARLO GAVAZZI SPACE SpA                   |  | AMS02-PDS PFM FULL FUNCTIONAL TEST REPORT |      | TEST PROCEDURE REFERENCE                                 |   | TEST REPORT REFERENCE                                    |   |  |  |
| UUT DATA :                                | Model  | PFM                                       | Item | AMS02 POWER DISTRIBUTION SYSTEM                          | C.I.  | PDS 18   | S/N   |  |  |
| STEP n°                                   | TEST SEQUENCE  |   |      |  | EXPECTED<br>VALUE                             | MEASURED<br>VALUE  | REMARKS                                       |  |  |
| PB2-1-A-47                                | Set ON on DCDC OFF/ON command window and send the command      |   |      |  | OK  | OK   | OK  |  |  |
| PB2-1-A-48                                | Click on the command READ ALL under the column Digital Readout |   |      |  | OK  | OK   | Power cell ON                                 |  |  |
| Verify the status of the following flags: |  |   |      |  |   |  |   |  |  |
| BOARD STATUS                              |  |   |      |  |   |  |   |  |  |
| OVT ALARM                                 |  |   |      |  | OK  | OK   |   |  |  |
| Input OVC Alarm                           |  |   |      |  | OK  | OK   |   |  |  |
| DCDC ON/OFF                               |  |   |      |  | ON  | ON   |   |  |  |
| 27V UNV                                   |  |   |      |  | OK  | OK   |   |  |  |
| 29V Trip                                  |  |   |      |  | OK  | OK   |   |  |  |
| DCDC OFF/ON CMD                           |  |   |      |  | ON  | ON   |   |  |  |
| PB2-1-A-50                                | Set the CAN BUS board address to 30                            |   |      |  | 30  | 30   |   |  |  |
| PB2-1-A-51                                | Select "CAN BUS I/F Side" to A                                 |   |      |  | A   | A  |   |  |  |
| PB2-1-A-52                                | Click on the command READ ALL under the column Digital Readout |   |      |  | OK  | OK   |   |  |  |
| Verify the status of the following flags: |  |   |      |  |   |  |   |  |  |
| BOARD STATUS                              |  |   |      |  |   |  |   |  |  |
| OVT ALARM                                 |  |   |      |  | OK  | OK   |   |  |  |
| Input OVC Alarm                           |  |   |      |  | OK  | OK   |   |  |  |
| DCDC ON/OFF                               |  |   |      |  | ON  | ON   |   |  |  |
| 27V UNV                                   |  |   |      |  | OK  | OK   |   |  |  |
| 29V Trip                                  |  |   |      |  | OK  | OK   |   |  |  |
| DCDC OFF/ON CMD                           |  |   |      |  | ON  | ON   |   |  |  |

DATE: 10.05.09 TEST CONDUCTOR *Eg 10/10* QA */*

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AMSO2-PDS

CARLO GAVAZZI SPACE SPA

| UNIT DATA : | Model         | PFM | Item | AMS02 POWER DISTRIBUTION SYSTEM |  |  | C.I. | PDS 18 | EXPECTED VALUE | MEASURED VALUE | S/N | FM01    |
|-------------|---------------|-----|------|---------------------------------|--|--|------|--------|----------------|----------------|-----|---------|
| STEP n°     | TEST SEQUENCE |     |      |                                 |  |  |      |        |                |                |     | REMARKS |

10.3.1.5.4 ESEM 3A-1 SIDE A

| CARLO GAVAZZI  |               | AMS02-PDS                                  |                                       | N° Doc: PDS-PR-CGS-006  | N° Doc: PDS-RP-CGS-072   |
|--|---------------|--|---------------------------------------|---|--|
| CARLO GAVAZZI SPACE SpA  |               | AMSS02-PDS PFM FULL FUNCTIONAL TEST REPORT |                                       | Doc N°: 2   | Doc N°: 1  |
| UUT DATA :   |               | Model: PFM                                 | Item: AMS02 POWER DISTRIBUTION SYSTEM | Ediz.: 10/06/2009   | Data: 27/06/2009   |
| STEP n°  |               | TEST SEQUENCE                              |                                       | TEST PROCEDURE REFERENCE  |  |
| STEP n°  | TEST SEQUENCE | ITEM                                       | C.I.                                  | PDS 18  | S/N FM01   |
|  |               |  |                                       | EXPECTED VALUE  | MEASURED VALUE   |
|  |               |  |                                       | REMARKS   |  |
| O_4 Current: SPD1_N<br>O_5 Current: UGPD_N<br>O_6 Current: SPD0_R<br>O_7 Current: TPD1<br>O_8 Current: TTPD_R<br>Temperature<br>Analog Ref. 3.0V                                       |               |  |                                       | 0,000A±0,225A<br>0,000A±0,225A<br>0,000A±0,225A<br>0,000A±0,225A<br>0,00A±0,45A<br>-40°C<T<80°C<br>3,000V±250mV                     | -0,018V<br>0,024V<br>-0,084V<br>-0,024V<br>0,002V<br>28,47°C<br>2,999V       |
| Measure with multimeter the voltage on this ESEM 3-A loads:<br>O_1: TPD3<br>O_2: TPD7<br>O_3: JPD_N<br>O_4: SPD1_N<br>O_5: UGPD_N<br>O_6: SPD0_R<br>O_7: TPD1<br>O_8: TTPD_R           |               |  |                                       | 0,00V<V<1,00V<br>0,00V<V<1,00V<br>28,00V±1,00V<br>0,00V<V<1,00V<br>0,00V<V<1,00V<br>0,00V<V<1,00V<br>0,00V<V<1,00V<br>0,00V<V<1,00V | 0,10V<br>0,05V<br>28,15V<br>0,08V<br>0,03V<br>0,08V<br>0,08V<br>0,08V        |
| 3A-1-A.16 Set "OFF" in the window "O_3: JPD_N" and push the relative "W" command   |               |  |                                       | OK  | OK   |
| 3A-1-A.17 Measure with multimeter the voltage on O_3: JPD_N  |               |  |                                       | 0,00V<V<1,00V   | 0,05V  |
| 3A-1-A.18 Click on Read All in Digital readout column and verify O_3 CMD:JPD_N   |               |  |                                       | OFF   | OFF  |
| 3A-1-A.19 Set ON in the window All Outlets ON/OFF and push the relative "W" command  |               |  |                                       | OK  | OK   |
| 3A-1-A.20 Measure with multimeter the voltage on this ESEM 3-A loads:<br>O_1: TPD3<br>O_2: TPD7<br>O_3: JPD_N<br>O_4: SPD1_N<br>O_5: UGPD_N<br>O_6: SPD0_R<br>O_7: TPD1<br>O_8: TTPD_R |               |  |                                       | 28,00V±1,00V<br>28,00V±1,00V<br>28,00V±1,00V<br>28,00V±1,00V<br>28,00V±1,00V<br>28,00V±1,00V<br>28,00V±1,00V<br>28,00V±1,00V        | 28,15V<br>28,09V<br>28,15V<br>28,15V<br>28,15V<br>28,15V<br>28,15V<br>28,15V |
| 3A-1-A.21 Click on Read All command in Digital Readout column<br>Verify the status of the following flags:<br>BOARD STATUS   |               |  |                                       | OK  | OK   |
| 3A-1-A.22 OVT Alarm<br>From O_1 CMD: TPD3 to O_8 CMD: TTPD_R<br>From O_1 Status: TPD3 to O_8 Status: TTPD_R  |               |  |                                       | OK<br>ON<br>ON<br>ON<br>ON  | OK<br>ON<br>ON<br>ON   |
| 3A-1-A.23 Set Off in All outlets ON/OFF command and push on the relative "W" command   |               |  |                                       | OK  | OK   |
| 3A-1-A.24 Click on Read all to in Digital readout column<br>Verify from digital readout column that all outlets are OFF  |               |  |                                       | OK  | OK   |
| 3A-1-A.25 DATE: 10.06.09 TEST CONDUCTOR <i>g. g. r. u. 10</i>  |               | QA <i>✓</i>                                |                                       | CUSTOMER  |  |

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| <br><b>CARLO GAVAZZI</b><br><b>CARLO GAVAZZI SPACE SPA</b> | <h1 style="text-align: center;"><b>AMS02-PDS</b></h1>   |   |   |
|   | AMS02-PDS PFM FULL FUNCTIONAL TEST REPORT   | Pagina<br>Page                                | 54<br>of<br>370   |
| UUT DATA :  | Model   | PFM   | Item  |
| STEP n°   | TEST SEQUENCE   | C.I.  | PDS 18  |
|   |   | EXPECTED<br>VALUE                             | MEASURED<br>VALUE   |
|   |   | S/N   | FM01  |
|   |   | TEST PROCEDURE REFERENCE                      | TEST REPORT REFERENCE   |
|   |   | N° Doc:<br>Doc N°:<br>Ediz.:<br>Issue:        | PDS-PR-CGS-006<br>Data:<br>Date:<br>10/06/2009<br>1<br>Pagina<br>Page |
|   |   | Issue:<br>/Issue:                             | Data:<br>Date:<br>27/06/2009<br>1<br>Pagina<br>Page                   |
|   |   | Ediz.:<br>/Issue:                             | 1<br>di<br>54<br>of<br>370  |
|   |   | N° Doc:<br>Doc N°:<br>Ediz.:<br>Issue:        | PDS-RP-CGS-072<br>Data:<br>Date:<br>27/06/2009<br>1<br>Pagina<br>Page |
|   |   | Issue:<br>/Issue:                             | Data:<br>Date:<br>27/06/2009<br>1<br>Pagina<br>Page                   |
|   |   | Ediz.:<br>/Issue:                             | 1<br>di<br>54<br>of<br>370  |
| <b>10.3.1.5.4.1 ESEM 3A-1 OUT 1 CURRENT LIMITERS</b>  |   |   |   |
| 3A-1-A.26   | Disconnect outlet cables  | OK  | OK  |
| 3A-1-A.27   | Connect outlet cables to short circuit simulator without ammeter  | OK  | OK  |
| 3A-1-A.28   | Set short circuit simulator to 3ms  | OK  | OK  |
| 3A-1-A.29   | Set ON in All outlets ON/OFF command and push on the relative "W" command   | OK  | OK  |
| 3A-1-A.30   | Click on Read all in Digital readout column and verify from outlet status located in Digital readout column that all outlets are on                                   | OK  | OK  |
| 3A-1-A.31   | Create short circuit pressing start button on short circuit simulator   | OK  | OK  |
| 3A-1-A.32   | Verify the status of the following flags:<br><br>BOARD STATUS   | OK  | OK  |
| 3A-1-A.33   | Click on Read all in Digital readout column and verify from outlet status located in Digital readout column that all outlets are on                                   | OK  | OK  |
| 3A-1-A.34   | Set short circuit simulator to 10ms short circuit duration  | OK  | OK  |
| 3A-1-A.35   | Monitor the short circuit current with a current probe (Ch1 of oscilloscope)<br>Monitor the 28V of a different outlet of Esem3A under test (Ch2 of oscilloscope)      | OK  | OK  |
| 3A-1-A.36   | Create the short circuit pressing start button on short circuit simulator   | OK  | OK  |
| 3A-1-A.37   | Make an hardcopy of the oscilloscope measurements   | OK  | OK  |
| 3A-1-A.38   | Measure in the previous picture the current limitation value  | 6,50A±10%                                     | 6,33A   |
| 3A-1-A.39   | Measure in previous picture the current limitation time   | 5ms<T lim<6ms                                 | 5,22ms  |
| 3A-1-A.40   | Verify with multimeter the absence of output voltage across load 1  | 0,00V±1,00V                                   | 0,00V   |
| 3A-1-A.41   | Click on Read All command in Digital Readout column   | OK  | OK  |
|   | Verify the status of the following flags:<br><br>BOARD STATUS   | NOK   | NOK   |
|   | OVT Alarm   | OK  | OK  |
| 3A-1-A.42   | O_1 Status: TPD3<br>O_2 Status: TPD7<br>O_3 Status: JPD_N<br>O_4 Status: SPD1_N<br>O_5 Status: UGPD_N<br>O_6 Status: SPD0_R<br>O_7 Status: TPD1<br>O_8 Status: TTPD_R | OFF<br>ON<br>ON<br>ON<br>ON<br>ON<br>ON<br>ON | OFF<br>ON<br>ON<br>ON<br>ON<br>ON<br>ON<br>ON                         |
| 3A-1-A.43   | Set the CAN BUS board address to 31   | 31  | 31  |
| 3A-1-A.44   | Select "CAN BUS If Side" to B   | B   | B   |
| 3A-1-A.45   | Click on Read All command in Digital Readout column   | OK  | OK  |
| DATE: 10.06.09  | TEST CONDUCTOR  | QA  | CUSTOMER  |

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|-------------------------|---|---|------|--------------------------|------------------------|
| CARLO GAVAZZI SPACE SpA |   | AMS02-PDS PFM FULL FUNCTIONAL TEST REPORT |      | Doc N°: 2                | Doc N°: 1              |
| UUT DATA :              | Model   | PFM                                       | Item | TEST PROCEDURE REFERENCE | TEST REPORT REFERENCE  |
| STEP n°                 | TEST SEQUENCE   |   | C.I. | SIN                      | FM01                   |
|                         | Verify the status of the following flags:                                   |   |      |                          |                        |
|                         | BOARD STATUS  |   |      |                          |                        |
|                         | OVT Alarm   |   |      |                          |                        |
|                         | O_1 Status: TPD3  |   |      |                          |                        |
|                         | O_2 Status: TPD7  |   |      |                          |                        |
| 3A-1-A.46               | O_3 Status: JPD_N   |   |      |                          |                        |
|                         | O_4 Status: SPD1_N  |   |      |                          |                        |
|                         | O_5 Status: UGPD_N  |   |      |                          |                        |
|                         | O_6 Status: SPD0_R  |   |      |                          |                        |
|                         | O_7 Status: TPD1  |   |      |                          |                        |
|                         | O_8 Status: TTPD_R  |   |      |                          |                        |
| 3A-1-A.47               | Set OFF in the window All Outlets ON/OFF and push the relative "W" command  |   |      |                          |                        |
| 3A-1-A.48               | Disconnect the short circuit simulator from outlet cables                   |   |      |                          |                        |
| 3A-1-A.49               | Disconnect current probe  |   |      |                          |                        |
| 3A-1-A.50               | Connect outlet cables to active load  |   |      |                          |                        |
| 3A-1-A.51               | Set ON in All outlets ON/OFF command and push on the relative "W" command   |   |      |                          |                        |
|                         | Verify the status of the following flags:                                   |   |      |                          |                        |
|                         | BOARD STATUS  |   |      |                          |                        |
|                         | OVT Alarm   |   |      |                          |                        |
|                         | From O_1 Status: TPD3 to O_8 Status: TTPD_R                                 |   |      |                          |                        |
| 3A-1-A.53               | Set the CAN BUS board address to 30   |   |      |                          |                        |
| 3A-1-A.54               | Select "CAN BUS I/F Side" to A  |   |      | A                        | A                      |
| 3A-1-A.55               | Set OFF in the window All Outlet's ON/OFF and push the relative "W" command |   |      | OK                       | OK                     |
| 3A-1-A.56               | Click on Read All command in Digital Readout column                         |   |      | OK                       | OK                     |
|                         | Verify the status of the following flags:                                   |   |      |                          |                        |
|                         | BOARD STATUS  |   |      |                          |                        |
|                         | OVT Alarm   |   |      |                          |                        |
|                         | From O_1 Status: TPD3 to O_8 Status: TTPD_R                                 |   |      |                          |                        |
| 3A-1-A.58               | Set ON in All outlets ON/OFF command and push on the relative "W" command   |   |      |                          |                        |
| 3A-1-A.59               | Click on Read All command in Digital Readout column                         |   |      |                          |                        |
|                         | Verify the status of the following flags:                                   |   |      |                          |                        |
|                         | BOARD STATUS  |   |      |                          |                        |
|                         | OVT Alarm   |   |      |                          |                        |
| 3A-1-A.60               | From O_1 Status: TPD3 to O_8 Status: TTPD_R                                 |   |      |                          |                        |
| 3A-1-A.61               | Set OFF in the window All Outlets ON/OFF and push the relative "W" command  |   |      |                          |                        |
| DATE: 10.06.09          | TEST CONDUCTOR  | Francesco                                 | QA   | CUSTOMER                 |                        |

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|-------------------------|--|---|------|--|---|------------------------------------|
| CARLO GAVAZZI SPACE SpA |  | AMS02-PDS PFM FULL FUNCTIONAL TEST REPORT |      | Ediz.: 2                                       | Date: 10/06/2009                        | Ediz.: 1                           |
|                         |  |   |      | Issue: Pagina Page                             | Issue: Pagina Page                      | Issue: Pagina Page                 |
|                         |  |   |      | TEST PROCEDURE REFERENCE                       | TEST REPORT REFERENCE                   | TEST REPORT REFERENCE              |
| STEP n°                 | TEST SEQUENCE  | Model                                     | Item | C.I.   | PDS 18                                  | SIN FM01                           |
|                         |  |   |      | EXPECTED VALUE                                 | MEASURED VALUE                          | REMARKS                            |
| 3A-1-A.62               | Click on Read All command in Digital Readout column  |   |      | OK   | OK                                      | OK                                 |
|                         | Verify the status of the following flags:  |   |      |  |   |                                    |
| 3A-1-A.63               | BOARD STATUS<br>OVT Alarm<br>From O_1 CMD: TPD3 to O_8 CMD: TTPD_R<br>From O_1 Status: TPD3 to O_8 Status: TTPD_R  |   |      | OK<br>OK<br>OFF<br>OFF                         | OK<br>OK<br>OFF<br>OFF                  | OK<br>OK                           |
| 3A-1-A.64               | Disconnect outlet cables   |   |      | OK   | OK                                      | OK                                 |
| 3A-1-A.65               | Connect outlet cables to short circuit simulator without amperometer   |   |      | OK   | OK                                      | OK                                 |
| 3A-1-A.66               | Set short circuit simulator to 3ms   |   |      | OK   | OK                                      | OK                                 |
| 3A-1-A.67               | Set ON in All outlets ON/OFF command and push on the relative "V" command  |   |      | OK   | OK                                      | OK                                 |
| 3A-1-A.68               | Click on Read all in Digital readout column and verify from outlet status located in Digital readout column that all outlets are on                              |   |      | OK   | OK                                      | OK                                 |
| 3A-1-A.69               | Create short circuit pressing start button on short circuit simulator  |   |      | OK   | OK                                      | OK                                 |
| 3A-1-A.70               | Verify the status of the following flags:<br>BOARD STATUS  |   |      | OK   | OK                                      | OK                                 |
| 3A-1-A.71               | Click on Read all in Digital readout column and verify from outlet status located in Digital readout column that all outlets are on                              |   |      | OK   | OK                                      | OK                                 |
| 3A-1-A.72               | Set short circuit simulator to 10ms short circuit duration   |   |      | OK   | OK                                      | OK                                 |
| 3A-1-A.73               | Monitor the short circuit current with a current probe (Ch1 of oscilloscope)<br>Monitor the 28V of a different outlet of Esem3A under test (Ch2 of oscilloscope) |   |      | OK   | OK                                      | OK                                 |
| 3A-1-A.74               | Create the short circuit pressing start button on short circuit simulator  |   |      | OK   | OK                                      | OK                                 |
| 3A-1-A.75               | Make an hardcopy of the oscilloscope measurements  |   |      | OK   | OK                                      | Add Annex 2 in the end of document |
| 3A-1-A.76               | Measure in the previous picture the current limitation value   |   |      | 6,50±10%<br>5ms<T lim<6ms                      | 6,46A<br>5,15ms                         |                                    |
| 3A-1-A.77               | Measure in previous picture the current limitation time  |   |      | 0,00V±1,00V                                    | 0,00V                                   | OK                                 |
| 3A-1-A.78               | Verify with multimeter the absence of output voltage across load 2   |   |      |  |   |                                    |
| 3A-1-A.79               | Click on Read All command in Digital Readout column<br>Verify the status of the following flags:<br>BOARD STATUS   |   |      |  |   |                                    |
|                         | OVT Alarm<br>O_1 Status: TPD3<br>O_2 Status: TPD7<br>O_3 Status: JPD_N<br>O_4 Status: SPD1_N<br>O_5 Status: UGPD_N<br>O_6 Status: SPDO_R                         |   |      | NOK<br>OK<br>ON<br>OFF<br>ON<br>ON<br>ON<br>ON | OK<br>ON<br>OFF<br>ON<br>ON<br>ON<br>ON | CUSTOMER                           |
| DATE: 10.06.09          | TEST CONDUCTOR   |   |      | QA   |   |                                    |

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|-------------------------|--|--|-----|---------------------------------------|--|---|---|
| CARLO GAVAZZI SPACE SpA |  | AMSO2-PDS PFM FULL FUNCTIONAL TEST REPORT                                  |     | 57<br>di<br>of                        | 10/06/2009<br>di<br>370                            | 1<br>57<br>Page   | 1<br>di<br>370  |
| UUT DATA :              |  | Model  | PFM | Item                                  | AMSO2 POWER DISTRIBUTION SYSTEM                    | C.I.  | TEST PROCEDURE REFERENCE                                  |
| STEP n°                 |  | TEST SEQUENCE  |     |                                       |  | EXPECTED<br>VALUE                                       | MEASURED<br>VALUE   |
| S/N                     |  | FM01   |     | S/N                                   |  | REMARKS   |   |
| 3A-1-A.81               |  | O_7 Status: TPD1   |     | ON                                    |  | ON  |   |
| 3A-1-A.82               |  | O_8 Status: TPD_R  |     | ON                                    |  | ON  |   |
| 3A-1-A.83               |  | Set the CAN BUS board address to 31  |     | 31                                    |  | 31  |   |
| 3A-1-A.84               |  | Select "CAN BUS I/F Side" to B   |     | B                                     |  | B   |   |
| 3A-1-A.85               |  | Click on Read All command in Digital Readout column                        |     | OK                                    |  | OK  |   |
| 3A-1-A.86               |  | Verify the status of the following flags:                                  |     | NOK                                   |  | NOK   |   |
| 3A-1-A.87               |  | BOARD STATUS   |     | OK                                    |  | OK  |   |
| 3A-1-A.88               |  | OVT Alarm  |     | ON                                    |  | ON  |   |
| 3A-1-A.89               |  | TPD3   |     | OFF                                   |  | OFF   |   |
| 3A-1-A.90               |  | O_1 Status: TPD7   |     | ON                                    |  | ON  |   |
| 3A-1-A.91               |  | O_3 Status: JPD_N  |     | ON                                    |  | ON  |   |
| 3A-1-A.92               |  | O_4 Status: SPD1_N   |     | ON                                    |  | ON  |   |
| 3A-1-A.93               |  | O_5 Status: UGPD_N   |     | ON                                    |  | ON  |   |
| 3A-1-A.94               |  | O_6 Status: SPD0_R   |     | ON                                    |  | ON  |   |
| 3A-1-A.95               |  | O_7 Status: TPD1   |     | ON                                    |  | ON  |   |
| 3A-1-A.96               |  | O_8 Status: TTPD_R   |     | ON                                    |  | ON  |   |
| 3A-1-A.97               |  | Set OFF in the window All Outlets ON/OFF and push the relative "W" command |     | OK                                    |  | OK  |   |
| 3A-1-A.98               |  | Disconnect the short circuit simulator from outlet cables                  |     | OK                                    |  | OK  |   |
| 3A-1-A.99               |  | Set ON in All outlets ON/OFF command and push on the relative "W" command  |     | OK                                    |  | OK  |   |
| 3A-1-A.100              |  | Verify the status of the following flags:                                  |     | OK                                    |  | OK  |   |
| 3A-1-A.101              |  | BOARD STATUS   |     | OK                                    |  | OK  |   |
| 3A-1-A.102              |  | OVT Alarm  |     | ON                                    |  | ON  |   |
| 3A-1-A.103              |  | From O_1 Status: TPD3 to O_8 Status: TTPD_R                                |     | OK                                    |  | OK  |   |
| 3A-1-A.104              |  | Set the CAN BUS board address to 30  |     | OK                                    |  | OK  |   |
| 3A-1-A.105              |  | Select "CAN BUS I/F Side" to A   |     | OK                                    |  | OK  |   |
| 3A-1-A.106              |  | Set OFF in the window All Outlets ON/OFF and push the relative "W" command |     | OK                                    |  | OK  |   |
| 3A-1-A.107              |  | Click on Read All command in Digital Readout column                        |     | OK                                    |  | OK  |   |
| 3A-1-A.108              |  | Verify the status of the following flags:                                  |     | OK                                    |  | OK  |   |
| 3A-1-A.109              |  | BOARD STATUS   |     | OK                                    |  | OK  |   |
| 3A-1-A.110              |  | OVT Alarm  |     | ON                                    |  | ON  |   |
| 3A-1-A.111              |  | From O_1 Status: TPD3 to O_8 Status: TTPD_R                                |     | OK                                    |  | OK  |   |
| 3A-1-A.112              |  | Set ON in All outlets ON/OFF command and push on the relative "W" command  |     | OK                                    |  | OK  |   |
| 3A-1-A.113              |  | Click on Read All command in Digital Readout column                        |     | OK                                    |  | OK  |   |
| 3A-1-A.114              |  | Verify the status of the following flags:                                  |     | OK                                    |  | OK  |   |
| DATE: 10.06.09          |  | TEST CONDUCTOR   |     | QA                                    |  | CUSTOMER  |   |

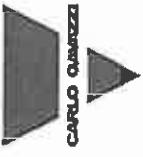
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|--|---|---|------|--|---|--|---|
| CARLO GAVAZZI SPACE SpA                              |   | AMS02-PDS PFM FULL FUNCTIONAL TEST REPORT |      | TEST PROCEDURE REFERENCE               |   | TEST REPORT REFERENCE                                    |   |
| UUT DATA :   | Model   | PFM                                       | Item | AMS02 POWER DISTRIBUTION SYSTEM        | C.I.  | PDS 18   | S/N   |
| STEP n°  | TEST SEQUENCE   |   |      | EXPECTED VALUE                         |   | MEASURED VALUE   | REMARKS   |
|  | BOARD STATUS  |   |      | OK                                     |   | OK   | OK  |
|  | OVT Alarm   |   |      | OK                                     |   | OK   | OK  |
| 3A-1-A.99  | From O_1 Status: TPD3 to O_8 Status: TTPD_R<br>Set OFF in the window All Outlets ON/OFF and push the relative "W" command           |   |      | ON                                     |   | ON   |   |
|  |   |   |      | OK                                     |   | OK   |   |
| <b>10.3.1.5.4.3 ESEM 3A-1 OUT 3 CURRENT LIMITERS</b> |   |   |      |  |   |  |   |
| 3A-1-A.100   | Click on Read All command in Digital Readout column   |   |      | OK                                     |   | OK   | OK  |
|  | Verify the status of the following flags:   |   |      |  |   |  |   |
|  | BOARD STATUS  |   |      | OK                                     |   | OK   | OK  |
| 3A-1-A.101   | OVT Alarm   |   |      | OK                                     |   | OK   | OK  |
|  | From O_1 CMD: TPD3 to O_8 CMD: TTPD_R   |   |      | OFF                                    |   | OFF  | OFF   |
|  | From O_1 Status: TPD3 to O_8 Status: TTPD_R   |   |      | OFF                                    |   | OFF  | OFF   |
| 3A-1-A.102   | Disconnect outlet cables  |   |      | OK                                     |   | OK   | OK  |
| 3A-1-A.103   | Connect outlet cables to short circuit simulator without amperometer  |   |      | OK                                     |   | OK   | OK  |
| 3A-1-A.104   | Set short circuit simulator to 3ms  |   |      | OK                                     |   | OK   | OK  |
| 3A-1-A.105   | Set ON in All outlets ON/OFF command and push on the relative "W" command   |   |      | OK                                     |   | OK   | OK  |
| 3A-1-A.106   | Click on Read all in Digital readout column and verify from outlet status located in Digital readout column                         |   |      | OK                                     |   | OK   | OK  |
| 3A-1-A.107   | Create short circuit pressing start button on short circuit simulator   |   |      | OK                                     |   | OK   | OK  |
| 3A-1-A.108   | Verify the status of the following flags:   |   |      | OK                                     |   | OK   |   |
| 3A-1-A.109   | Click on Read all in Digital readout column and verify from outlet status located in Digital readout column that all outlets are on |   |      | OK                                     |   | OK   | OK  |
| 3A-1-A.110   | Set short circuit simulator to 10ms short circuit duration  |   |      | OK                                     |   | OK   | OK  |
| 3A-1-A.111   | Monitor the short circuit current with a current probe (Ch1 of oscilloscope)  |   |      | OK                                     |   | OK   | OK  |
| 3A-1-A.112   | Monitor the 28V of a different outlet of Esem3A under test (Ch2 of oscilloscope)  |   |      | OK                                     |   | OK   | OK  |
| 3A-1-A.113   | Create then short circuit pressing start button on short circuit simulator  |   |      | OK                                     |   | OK   |   |
| 3A-1-A.114   | Make an hardcopy of the oscilloscope measurements   |   |      | 6,50A±0%                               |   | 6,43A  |   |
| 3A-1-A.115   | Measure in previous picture the current limitation value  |   |      | 5ms<T_limi<6ms                         |   | 5,15ms   |   |
| 3A-1-A.116   | Measure in previous picture the current limitation time   |   |      | 0,00V±1,00V                            |   | 0,00V  |   |
| 3A-1-A.117   | Verify with multimeter the absence of output voltage across load 3  |   |      | OK                                     |   | OK   |   |
| 3A-1-A.118   | Click on Read All command in Digital Readout column   |   |      | NOK                                    |   | NOK  |   |
|  | Verify the status of the following flags:   |   |      | OK                                     |   | OK   |   |
|  | BOARD STATUS  |   |      |  |   |  |   |
|  | OVT Alarm   |   |      |  |   |  |   |
| DATE: 10.06.09                                       | TEST CONDUCTOR  | QA  |      |  |   |  | CUSTOMER  |

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| CARLO GAVAZZI   |                | <b>AMSO2-PDS</b>                          |     | N° Doc:<br>Doc N°:<br>Ediz.:<br>Issue:                      |                                 | N° Doc:<br>Doc N°:<br>Ediz.:<br>Issue:                      |                          |
|---|----------------|---|-----|---|---------------------------------|---|--------------------------|
| CARLO GAVAZZI SPACE SpA   |                | AMSO2-PDS PFM FULL FUNCTIONAL TEST REPORT |     | PDS-PR-CGS-006<br>2<br>Data: 10/06/2009<br>Pagina 59 di 370 |                                 | PDS-RP-CGS-072<br>1<br>Data: 27/06/2009<br>Pagina 59 di 370 |                          |
| UUT DATA :  |                | Model                                     | PFM | Item  | AMSO2 POWER DISTRIBUTION SYSTEM | C.I.  | TEST PROCEDURE REFERENCE |
| STEP n°   |                | TEST SEQUENCE                             |     | S/N   |                                 | FM01  |                          |
| O_1 Status: TPD3  |                |   |     | ON  |                                 | ON  |                          |
| O_2 Status: TPD7  |                |   |     | ON  |                                 | ON  |                          |
| O_3 Status: JPD_N   |                |   |     | OFF   |                                 | OFF   |                          |
| O_4 Status: SPD1_N  |                |   |     | ON  |                                 | ON  |                          |
| O_5 Status: UGPD_N  |                |   |     | ON  |                                 | ON  |                          |
| O_6 Status: SPDO_R  |                |   |     | ON  |                                 | ON  |                          |
| O_7 Status: TPD1  |                |   |     | ON  |                                 | ON  |                          |
| O_8 Status: TPPD_R  |                |   |     | ON  |                                 | ON  |                          |
| 3A-1-A.119 Set the CAN BUS board address to 31  |                |   |     | 31  |                                 | 31  |                          |
| 3A-1-A.120 Select "CAN BUS I/F Side" to B   |                |   |     | B   |                                 | B   |                          |
| 3A-1-A.121 Click on Read All command in Digital Readout column                        |                |   |     | OK  |                                 | OK  |                          |
| Verify the status of the following flags:   |                |   |     | NOK   |                                 | NOK   |                          |
| BOARD STATUS  |                |   |     | OK  |                                 | OK  |                          |
| OVT Alarm   |                |   |     | ON  |                                 | ON  |                          |
| O_1 Status: TPD3  |                |   |     | ON  |                                 | ON  |                          |
| O_2 Status: TPD7  |                |   |     | OFF   |                                 | OFF   |                          |
| O_3 Status: JPD_N   |                |   |     | ON  |                                 | ON  |                          |
| O_4 Status: SPD1_N  |                |   |     | ON  |                                 | ON  |                          |
| O_5 Status: UGPD_N  |                |   |     | ON  |                                 | ON  |                          |
| O_6 Status: SPDO_R  |                |   |     | ON  |                                 | ON  |                          |
| O_7 Status: TPD1  |                |   |     | ON  |                                 | ON  |                          |
| O_8 Status: TPPD_R  |                |   |     | ON  |                                 | ON  |                          |
| 3A-1-A.123 Set OFF in the window All Outlets ON/OFF and push the relative "W" command |                |   |     | OK  |                                 | OK  |                          |
| 3A-1-A.124 Disconnect the short circuit simulator from outlet cables                  |                |   |     | OK  |                                 | OK  |                          |
| 3A-1-A.125 Disconnect current probe   |                |   |     | OK  |                                 | OK  |                          |
| 3A-1-A.126 Connect outlet cables to active load                                       |                |   |     | OK  |                                 | OK  |                          |
| 3A-1-A.127 Set ON in All outlets ON/OFF command and push the relative "W" command     |                |   |     | OK  |                                 | OK  |                          |
| Verify the status of the following flags:   |                |   |     | OK  |                                 | OK  |                          |
| BOARD STATUS  |                |   |     | OK  |                                 | OK  |                          |
| OVT Alarm   |                |   |     | ON  |                                 | ON  |                          |
| From O_1 Status: TPD3 to O_8 Status: TPPD_R   |                |   |     | OK  |                                 | OK  |                          |
| 3A-1-A.129 Set the CAN BUS board address to 30  |                |   |     | 30  |                                 | 30  |                          |
| 3A-1-A.130 Select "CAN BUS I/F Side" to A   |                |   |     | A   |                                 | A   |                          |
| 3A-1-A.131 Set OFF in the window All Outlets ON/OFF and push the relative "W" command |                |   |     | OK  |                                 | OK  |                          |
| 3A-1-A.132 Click on Read All command in Digital Readout column                        |                |   |     | OK  |                                 | OK  |                          |
| 3A-1-A.133 Verify the status of the following flags:                                  |                |   |     | OK  |                                 | OK  |                          |
| DATE: 10.06.09  | TEST CONDUCTOR | QA  | ✓   | CUSTOMER  |                                 |   |                          |

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|   |  |   |   |
|---|--|---|---|
|  | <b>AMS02-PDS</b>   |   |   |
|   | AMS02-PDS PFM FULL FUNCTIONAL TEST REPORT                                  |   |   |
| CARLO GAVAZZI SPACE SpA   |  | UUT DATA : Model PFM Item AMS02 POWER DISTRIBUTION SYSTEM | TEST PROCEDURE REFERENCE C.I. PDS 18 S/N FM01 |
| STEP n°   | TEST SEQUENCE  | EXPECTED VALUE  | MEASURED VALUE                                |
|   | BOARD STATUS<br>OVT Alarm<br>From O_1 Status: TPD3 to O_8 Status: TTPD_R   | OK<br>OK<br>OFF   | OK<br>OK<br>OFF                               |
| 3A-1-A-134  | Set ON in All outlets ON/OFF command and push on the relative "W" command  | OK  | OK  |
| 3A-1-A-135  | Click on Read All command in Digital Readout column                        | OK  | OK  |
|   | Verify the status of the following flags:                                  |   |   |
| 3A-1-A-136  | BOARD STATUS<br>OVT Alarm<br>From O_1 Status: TPD3 to O_8 Status: TTPD_R   | OK<br>OK<br>ON  | OK<br>OK<br>ON                                |
| 3A-1-A-137  | Set OFF in the window All Outlets ON/OFF and push the relative "W" command | OK  | OK  |

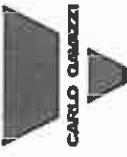
#### 10.3.1.5.4.4 ESEM 3A-1 OUT 4 CURRENT LIMITERS

|                |   |  |  |
|----------------|---|--|--|
| 3A-1-A-138     | Click on Read All command in Digital Readout column   | OK   | OK   |
|                | Verify the status of the following flags:<br>BOARD STATUS   | OK<br>OK<br>OFF<br>OFF   | OK<br>OK<br>OFF<br>OFF   |
| 3A-1-A-139     | OVT Alarm<br>From O_1 CMD: TPD3 to O_8 CMD: TTPD_R<br>From O_1 Status: TPD3 to O_8 Status: TTPD_R                                   | OK<br>OK<br>OFF<br>OFF   | OK<br>OK<br>OFF<br>OFF   |
| 3A-1-A-140     | Disconnect outlet cables  | OK   | OK   |
| 3A-1-A-141     | Connect outlet cables to short circuit simulator without amperometer  | OK   | OK   |
| 3A-1-A-142     | Set short circuit simulator to 3ms  | OK   | OK   |
| 3A-1-A-143     | Set ON in All outlets ON/OFF command and push on the relative "W" command   | OK   | OK   |
| 3A-1-A-144     | Click on Read all in Digital readout column and verify from outlet status located in Digital readout column that all outlets are on | OK   | OK   |
| 3A-1-A-145     | Create short circuit pressing start button on short circuit simulator   | OK   | OK   |
| 3A-1-A-146     | Verify the status of the following flags:<br>BOARD STATUS   | OK   | OK   |
| 3A-1-A-147     | Click on Read all in Digital readout column and verify from outlet status located in Digital readout column that all outlets are on | OK   | OK   |
| 3A-1-A-148     | Set short circuit simulator to 10ms short circuit duration  | OK   | OK   |
| 3A-1-A-149     | Monitor the short circuit current with a current probe (Ch1 of oscilloscope)  | OK   | OK   |
| 3A-1-A-150     | Monitor the 28V of a different outlet of Esem3A under test (Ch2 of oscilloscope)  | OK   | OK   |
| 3A-1-A-151     | Create the short circuit pressing start button on short circuit simulator   | OK   | OK   |
| 3A-1-A-152     | Make an hardcopy of the oscilloscope measurements   | OK   | Add Annex 4 in the end of document   |
|                | Measure in the previous picture the current limitation value  | 6,50±10%   | 6,52A  |
| DATE: 10.06.09 | TEST CONDUCTOR                                   | QA  | CUSTOMER  |

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|---|--|---|-----|--|--|--|--|-----------------------|
| CARLO GAVAZZI SPACE SpA                     |  | AMSO2-PDS PFM FULL FUNCTIONAL TEST REPORT |     | Pagina<br>Page                         | 61 di 370                                      | Pagina<br>Page                         | 61 di 370                                      |                       |
| UUT DATA :                                  |  | Model                                     | PFM | Item                                   | AMSO2 POWER DISTRIBUTION SYSTEM                | C.I.                                   | TEST PROCEDURE REFERENCE                       | TEST REPORT REFERENCE |
| STEP n°                                     | TEST SEQUENCE  |   |     |  |  | EXPECTED<br>VALUE                      | MEASURED<br>VALUE                              | REMARKS               |
| 3A-1-A-153                                  | Measure in previous picture the current limitation time                    |   |     |  |  | 5ms<T_lim<6ms                          | 5,22ms   |                       |
| 3A-1-A-154                                  | Verify with multimeter the absence of output voltage across load 4         |   |     |  |  | 0,00V±1,00V                            | 0,00V  |                       |
| 3A-1-A-155                                  | Click on Read All command in Digital Readout column                        |   |     |  |  | OK                                     | OK   |                       |
|   | Verify the status of the following flags:                                  |   |     |  |  |  |  |                       |
| BOARD STATUS                                |  |   |     |  |  |  |  |                       |
| OVT Alarm                                   |  |   |     |  |  |  |  |                       |
| O_1 Status: TPD3                            |  |   |     |  |  | OK                                     | OK   |                       |
| O_2 Status: TPD7                            |  |   |     |  |  | ON                                     | ON   |                       |
| 3A-1-A-156                                  | O_3 Status: JPD_N  |   |     |  |  | ON                                     | ON   |                       |
| O_4 Status: SPD1_N                          |  |   |     |  |  | ON                                     | ON   |                       |
| O_5 Status: UGPD_N                          |  |   |     |  |  | OFF                                    | OFF  |                       |
| O_6 Status: SPDO_R                          |  |   |     |  |  | ON                                     | ON   |                       |
| O_7 Status: TPDI                            |  |   |     |  |  | ON                                     | ON   |                       |
| O_8 Status: TTPD_R                          |  |   |     |  |  | ON                                     | ON   |                       |
| 3A-1-A-157                                  | Set the CAN BUS I/F Side to 31   |   |     |  |  | 31                                     | 31   |                       |
| 3A-1-A-158                                  | Select "CAN BUS I/F Side" to B   |   |     |  |  | B                                      | B  |                       |
| 3A-1-A-159                                  | Click on Read All command in Digital Readout column                        |   |     |  |  | OK                                     | OK   |                       |
|   | Verify the status of the following flags:                                  |   |     |  |  |  |  |                       |
| BOARD STATUS                                |  |   |     |  |  |  |  |                       |
| OVT Alarm                                   |  |   |     |  |  |  |  |                       |
| O_1 Status: TPD3                            |  |   |     |  |  | OK                                     | OK   |                       |
| O_2 Status: TPD7                            |  |   |     |  |  | ON                                     | ON   |                       |
| 3A-1-A-160                                  | O_3 Status: JPD_N  |   |     |  |  | ON                                     | ON   |                       |
| O_4 Status: SPD1_N                          |  |   |     |  |  | ON                                     | ON   |                       |
| O_5 Status: UGPD_N                          |  |   |     |  |  | OFF                                    | OFF  |                       |
| O_6 Status: SPDO_R                          |  |   |     |  |  | ON                                     | ON   |                       |
| O_7 Status: TPDI                            |  |   |     |  |  | ON                                     | ON   |                       |
| O_8 Status: TTPD_R                          |  |   |     |  |  | ON                                     | ON   |                       |
| 3A-1-A-161                                  | Set OFF in the window All Outlets ON/OFF and push the relative "W" command |   |     |  |  | OK                                     | OK   |                       |
| 3A-1-A-162                                  | Disconnect the short circuit simulator from outlet cables                  |   |     |  |  | OK                                     | OK   |                       |
| 3A-1-A-163                                  | Disconnect current probe   |   |     |  |  | OK                                     | OK   |                       |
| 3A-1-A-164                                  | Connect outlet cables to active load                                       |   |     |  |  | OK                                     | OK   |                       |
| 3A-1-A-165                                  | Set ON in All outlets ON/OFF command and push on the relative "W" command  |   |     |  |  | OK                                     | OK   |                       |
|   | Verify the status of the following flags:                                  |   |     |  |  |  |  |                       |
| BOARD STATUS                                |  |   |     |  |  |  |  |                       |
| Ovt Alarm                                   |  |   |     |  |  |  |  |                       |
| From O_1 Status: TPD3 to O_8 Status: TTPD_R |  |   |     |  |  | OK                                     | OK   |                       |
| DATE: 10.06.09                              | TEST CONDUCTOR   | QA  | 12  |  |  | CUSTOMER                               |  |                       |

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|--|---|----------------|--------------------------|
|  | <b>AMS02-PDS PFM FULL FUNCTIONAL TEST REPORT</b>  |                |                          |
| <b>UUT DATA :</b> <b>Model</b> <b>PFM</b> <b>Item</b> <b>AMS02 POWER DISTRIBUTION SYSTEM</b>   |   |                | TEST PROCEDURE REFERENCE |
| STEP n°  | TEST SEQUENCE   | C.I.           | S/N      FM01            |
|  |   | EXPECTED VALUE | MEASURED VALUE           |
|  |   | REMARKS        |                          |
| 3A-1-A.167   | Set the CAN BUS board address to 31   | 30             | 30                       |
| 3A-1-A.168   | Select "CAN BUS I/F Side" to B  | A              | A                        |
| 3A-1-A.169   | Set OFF in the window All Outlets ON/OFF and push the relative "W" command                                  | OK             | OK                       |
| 3A-1-A.170   | Click on Read All command in Digital Readout column   | OK             | OK                       |
|  | Verify the status of the following flags:   |                |                          |
| 3A-1-A.171   | BOARD STATUS  | OK             | OK                       |
|  | OVT Alarm   | OK             | OK                       |
|  | From O_1 Status: TPD3 to O_8 Status: TTPD_R   | OFF            | OFF                      |
| 3A-1-A.172   | Set ON in All outlets ON/OFF command and push on the relative "W" command                                   | OK             | OK                       |
| 3A-1-A.173   | Click on Read All command in Digital Readout column   | OK             | OK                       |
|  | Verify the status of the following flags:   |                |                          |
| 3A-1-A.174   | BOARD STATUS  | OK             | OK                       |
|  | OVT Alarm   | OK             | OK                       |
|  | From O_1 Status: TPD3 to O_8 Status: TTPD_R   | ON             | ON                       |
| 3A-1-A.175   | Set OFF in the window All Outlets ON/OFF and push the relative "W" command                                  | OK             | OK                       |
|  |   |                |                          |
| <b>10.3.1.5.4.5 ESEM 3A-1 OUT 5 CURRENT LIMITERS</b>   |   |                |                          |
| 3A-1-A.176   | Click on Read All command in Digital Readout column   | OK             | OK                       |
|  | Verify the status of the following flags:   |                |                          |
| 3A-1-A.177   | BOARD STATUS  | OK             | OK                       |
|  | OVT Alarm   | OK             | OK                       |
|  | From O_1 CMD: TPD3 to O_8 CMD: TTPD_R   | OFF            | OFF                      |
| 3A-1-A.178   | From O_1 Status: TPD3 to O_8 Status: TTPD_R   | OFF            | OFF                      |
|  | Disconnect outlet cables  | OK             | OK                       |
| 3A-1-A.179   | Connect outlet cables to short circuit simulator without ammeter  | OK             | OK                       |
| 3A-1-A.180   | Set short circuit simulator to 3ms  | OK             | OK                       |
| 3A-1-A.181   | Set ON in All outlets ON/OFF command and push on the relative "W" command                                   | OK             | OK                       |
| 3A-1-A.182   | Click on Read all in Digital readout column and verify from outlet status located in Digital readout column | OK             | OK                       |
|  | that all outlets are on   |                |                          |
| 3A-1-A.183   | Create short circuit pressing start button on short circuit simulator                                       | OK             | OK                       |
|  | Verify the status of the following flags:   |                |                          |
| 3A-1-A.184   | BOARD STATUS  | OK             | OK                       |
|  | Click on Read all in Digital readout column and verify from outlet status located in Digital readout column | OK             | OK                       |
|  | that all outlets are on   |                |                          |
| <b>DATE:</b> <i>10.06.09</i> <b>TEST CONDUCTOR</b> <i>J. F. Co., -</i>   |   | <b>QA</b>      | <b>CUSTOMER</b>          |
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| <b>AMS02-PDS</b>                          |  |   |      | N° Doc:<br>Doc N°:<br>Ediz.:<br>Issue: | PDS-PR-CGS-006<br>Data:<br>Date:<br>2<br>10/06/2009 | N° Doc:<br>Doc N°:<br>Ediz.:<br>Issue: | PDS-RP-CGS-072<br>Data:<br>Date:<br>1<br>27/06/2009 |
|---|--|---|------|--|---|--|---|
| CARLO GAVAZZI SPACE SpA                   |  | AMS02-PDS PFM FULL FUNCTIONAL TEST REPORT |      | Pagina<br>Page                         | 63<br>di<br>370<br>of                               | Pagina<br>Page                         | 63<br>di<br>370<br>of                               |
| UUT DATA :                                |  | Model                                     | Item | TEST PROCEDURE REFERENCE               |   | TEST REPORT REFERENCE                  |   |
| STEP n°                                   | TEST SEQUENCE  |   | C.I. | PDS 16                                 | S/N   | FM01                                   |   |
|   |  |   |      | EXPECTED<br>VALUE                      | MEASURED<br>VALUE                                   | REMARKS                                |   |
| 3A-1-A.186                                | Set short circuit simulator to 10ms short circuit duration                       |   |      | OK                                     | OK  | OK                                     |   |
| 3A-1-A.187                                | Monitor the short circuit current with a current probe (Ch1 of oscilloscope)     |   |      | OK                                     | OK  | OK                                     |   |
| 3A-1-A.188                                | Monitor the 28V of a different outlet of Esem3A under test (Ch2 of oscilloscope) |   |      | OK                                     | OK  | OK                                     |   |
| 3A-1-A.189                                | Create the short circuit pressing start button on short circuit simulator        |   |      | OK                                     | OK  | OK                                     |   |
| 3A-1-A.190                                | Make an hardcopy of the oscilloscope measurements                                |   |      | 6,50A±10%                              | 6,47A   | Add Annex_5 in the end of document     |   |
| 3A-1-A.191                                | Measure in the previous picture the current limitation value                     |   |      | 5ms<T <sub>lim</sub> <6ms              | 5,14ms  |  |   |
| 3A-1-A.192                                | Measure in previous picture the current limitation time                          |   |      | 0,0004±1,00V                           | 0,00V   |  |   |
| 3A-1-A.193                                | Verify with multimeter the absence of output voltage across load 5               |   |      | OK                                     | OK  | OK                                     |   |
| 3A-1-A.194                                | Click on Read All command in Digital Readout column                              |   |      |  |   |  |   |
| Verify the status of the following flags: |  |   |      |  |   |  |   |
| BOARD STATUS                              |  |   |      |  |   |  |   |
| OVT Alarm                                 |  | O_1 Status: TPD3                          |      | NOK                                    | NOK   | NOK                                    |   |
| O_1 Status: TPD3                          |  | O_2 Status: TPD7                          |      | OK                                     | OK  | OK                                     |   |
| O_2 Status: TPD7                          |  | O_3 Status: JPD_N                         |      | ON                                     | ON  | ON                                     |   |
| O_3 Status: JPD_N                         |  | O_4 Status: SPD1_N                        |      | ON                                     | ON  | ON                                     |   |
| O_4 Status: SPD1_N                        |  | O_5 Status: UGPD_N                        |      | ON                                     | OFF   | OFF                                    |   |
| O_5 Status: UGPD_N                        |  | O_6 Status: SPD0_R                        |      | ON                                     | ON  | ON                                     |   |
| O_6 Status: SPD0_R                        |  | O_7 Status: TPD1                          |      | ON                                     | ON  | ON                                     |   |
| O_7 Status: TPD1                          |  | O_8 Status: TTPD_R                        |      | ON                                     | ON  | ON                                     |   |
| O_8 Status: TTPD_R                        |  |   |      |  |   |  |   |
| 3A-1-A.195                                | Set the CAN BUS board address to 31  |   |      | 31                                     | 31  | 31                                     |   |
| 3A-1-A.196                                | Select "CAN BUS If_Side" to B  |   |      | B                                      | B   | B                                      |   |
| 3A-1-A.197                                | Click on Read All command in Digital Readout column                              |   |      | OK                                     | OK  | OK                                     |   |
| Verify the status of the following flags: |  |   |      |  |   |  |   |
| BOARD STATUS                              |  |   |      |  |   |  |   |
| OVT Alarm                                 |  | O_1 Status: TPD3                          |      | NOK                                    | NOK   | NOK                                    |   |
| O_1 Status: TPD3                          |  | O_2 Status: TPD7                          |      | OK                                     | OK  | OK                                     |   |
| O_2 Status: TPD7                          |  | O_3 Status: JPD_N                         |      | ON                                     | ON  | ON                                     |   |
| O_3 Status: JPD_N                         |  | O_4 Status: SPD1_N                        |      | ON                                     | ON  | ON                                     |   |
| O_4 Status: SPD1_N                        |  | O_5 Status: UGPD_N                        |      | ON                                     | OFF   | OFF                                    |   |
| O_5 Status: UGPD_N                        |  | O_6 Status: SPD0_R                        |      | ON                                     | ON  | ON                                     |   |
| O_6 Status: SPD0_R                        |  | O_7 Status: TPD1                          |      | ON                                     | ON  | ON                                     |   |
| O_7 Status: TPD1                          |  | O_8 Status: TTPD_R                        |      | ON                                     | ON  | ON                                     |   |
| O_8 Status: TTPD_R                        |  |   |      |  |   |  |   |
| 3A-1-A.199                                | Set OFF in the window All Outlets ON/OFF and push the relative "W" command       |   |      | OK                                     | OK  | OK                                     |   |
| 3A-1-A.200                                | Disconnect the short circuit simulator from outlet cables                        |   |      | OK                                     | OK  | OK                                     |   |
| 3A-1-A.201                                | Disconnect current probe   |   |      | OK                                     | OK  | OK                                     |   |
| DATE: 06.09                               | TEST CONDUCTOR <i>J. Faro</i>  |   | QA   | <i>J. Faro</i>                         |   | CUSTOMER <i>J. Faro</i>                |   |

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| CARLO GAVAZZI  |   | AMS02-PDS                                  |      | N° Doc:<br>Doc N°:<br>Ediz.:<br>Issue:<br>Pagina<br>Page | PDS-PR-CGS-006<br>Data:<br>Date:<br>2<br>10/06/2009<br>di<br>370 | N° Doc:<br>Doc N°:<br>Ediz.:<br>Issue:<br>Pagina<br>Page | PDS-RP-CGS-072<br>Data:<br>Date:<br>1<br>27/06/2009<br>di<br>370 |
|--|---|--|------|--|--|--|--|
| CARLO GAVAZZI SPACE SpA                              |   | AMS02-PDS PFMI FULL FUNCTIONAL TEST REPORT |      | TEST PROCEDURE REFERENCE                                 |  | TEST REPORT REFERENCE                                    |  |
| UUT DATA :   | Model   | PFM  | Item | AMS02 POWER DISTRIBUTION SYSTEM                          | C.I.   | PDS 18   | S/N  |
| STEP n°  | TEST SEQUENCE   |  |      | EXPECTED<br>VALUE  | MEASURED<br>VALUE  |  | REMARKS  |
| 3A-1-A-202   | Connect outlet cables to active load  |  |      | OK   | OK   | OK   |  |
| 3A-1-A-203   | Set ON in All outlets ON/OFF command and push on the relative "W" command                                   |  |      | OK   | OK   | OK   |  |
|  | Verify the status of the following flags:   |  |      |  |  |  |  |
| 3A-1-A-204   | BOARD STATUS  |  |      | OK   | OK   | OK   |  |
|  | OVT Alarm   |  |      | ON   | ON   | ON   |  |
|  | From O_1 Status: TPD3 to O_8 Status: TTPD_R   |  |      |  |  |  |  |
| 3A-1-A-205   | Set the CAN BUS board address to 30   |  |      | 30   | 30   | 30   | In order to verify that CAN BUS 30 is able to reset a protection |
| 3A-1-A-206   | Select "CAN BUS I/F Side" to A  |  |      | A  | A  | A  |  |
| 3A-1-A-207   | Set OFF in the window All Outlets ON/OFF and push the relative "W" command                                  |  |      | OK   | OK   | OK   |  |
| 3A-1-A-208   | Click on Read All command in Digital Readout column   |  |      | OK   | OK   | OK   |  |
|  | Verify the status of the following flags:   |  |      |  |  |  |  |
| 3A-1-A-209   | BOARD STATUS  |  |      | OK   | OK   | OK   |  |
|  | OVT Alarm   |  |      | OFF  | OFF  | OFF  |  |
|  | From O_1 Status: TPD3 to O_8 Status: TTPD_R   |  |      |  |  |  |  |
| 3A-1-A-210   | Set ON in All outlets ON/OFF command and push on the relative "W" command                                   |  |      | OK   | OK   | OK   |  |
| 3A-1-A-211   | Click on Read All command in Digital Readout column   |  |      | OK   | OK   | OK   |  |
|  | Verify the status of the following flags:   |  |      |  |  |  |  |
| 3A-1-A-212   | BOARD STATUS  |  |      | OK   | OK   | OK   |  |
|  | OVT Alarm   |  |      | ON   | ON   | ON   |  |
|  | From O_1 Status: TPD3 to O_8 Status: TTPD_R   |  |      |  |  |  |  |
| 3A-1-A-213   | Set OFF in the window All Outlets ON/OFF and push the relative "W" command                                  |  |      | OK   | OK   | OK   |  |
| <b>10.3.1.5.4.6 ESEM 3A-1 OUT 6 CURRENT LIMITERS</b> |   |  |      |  |  |  |  |
| 3A-1-A-214   | Click on Read All command in Digital Readout column   |  |      | OK   | OK   | OK   |  |
|  | Verify the status of the following flags:   |  |      |  |  |  |  |
| 3A-1-A-215   | BOARD STATUS  |  |      | OK   | OK   | OK   |  |
|  | OVT Alarm   |  |      | OFF  | OFF  | OFF  |  |
|  | From O_1 CMD: TPD3 to O_8 CMD: TTPD_R   |  |      |  |  |  |  |
| 3A-1-A-216   | Disconnect outlet cables  |  |      | OK   | OK   | OK   |  |
| 3A-1-A-217   | Connect outlet cables to short circuit simulator without ammeter  |  |      | OK   | OK   | OK   |  |
| 3A-1-A-218   | Set short circuit simulator to 3ms  |  |      | OK   | OK   | OK   |  |
| 3A-1-A-219   | Set ON in All outlets ON/OFF command and push on the relative "W" command                                   |  |      | OK   | OK   | OK   |  |
| 3A-1-A-220   | Click on Read all in Digital readout column and verify from outlet status located in Digital readout column |  |      | OK   | OK   | OK   |  |
| DATE: 10.06.09                                       | TEST CONDUCTOR  | QA   |      |  |  |  | CUSTOMER   |

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TEST CONDUCTOR

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| AMS02-PDS               |   |   |      | N° Doc: PDS-RP-CGS-072          | N° Doc: PDS-PR-CGS-006 | N° Doc: PDS-RP-CGS-072 |
|-------------------------|---|---|------|---------------------------------|------------------------|------------------------|
| CARLO GAVAZZI SPACE SpA |   | AMS02-PDS PFM FULL FUNCTIONAL TEST REPORT |      | Doc N°: Ediz.: Issue:           | Date: 10/06/2009       | Doc N°: Ediz.: Issue:  |
| UUT DATA :              | Model   | PFM                                       | Item | AMS02 POWER DISTRIBUTION SYSTEM | C.I.                   | PDS 18                 |
| STEP n°                 | TEST SEQUENCE   |   |      | S/N                             | MEASURED VALUE         | TEST REPORT REFERENCE  |
|                         |   |   |      | EXPECTED VALUE                  | MEASURED VALUE         | REMARKS                |
| 3A-1-A-221              | that all outlets are on   |   |      | OK                              | OK                     |                        |
| 3A-1-A-222              | Create short circuit pressing start button on short circuit simulator   |   |      | OK                              | OK                     |                        |
| 3A-1-A-223              | Verify the status of the following flags:<br>BOARD STATUS   |   |      | OK                              | OK                     |                        |
| 3A-1-A-224              | Click on Read All in Digital Readout column and verify from outlet status located in Digital readout column that all outlets are on |   |      | OK                              | OK                     |                        |
| 3A-1-A-225              | Set short circuit simulator to 10ms short circuit duration  |   |      | OK                              | OK                     |                        |
| 3A-1-A-226              | Monitor the short circuit current with a current probe (Ch1 of oscilloscope)  |   |      | OK                              | OK                     |                        |
| 3A-1-A-227              | Monitor the 28V of a different outlet of Esem3A under test (Ch2 of oscilloscope)  |   |      | OK                              | OK                     |                        |
| 3A-1-A-228              | Create the short circuit pressing start button on short circuit simulator   |   |      | OK                              | OK                     |                        |
| 3A-1-A-229              | Make an handcopy of the oscilloscope measurements   |   |      | 6.50A±10%                       | 6.59A                  |                        |
| 3A-1-A-230              | Measure in the previous picture the current limitation value  |   |      | 5ms<T limit<6ms                 | 5.10ms                 |                        |
| 3A-1-A-231              | Measure in previous picture the absence of output voltage across load 6   |   |      | 0.000V±1.00V                    | 0.00V                  |                        |
| 3A-1-A-232              | Click on Read All command in Digital Readout column   |   |      | OK                              | OK                     |                        |
| 3A-1-A-233              | Verify the status of the following flags:<br>BOARD STATUS   |   |      | NOK                             | NOK                    |                        |
| 3A-1-A-234              | OVT Alarm   |   |      | OK                              | OK                     |                        |
| 3A-1-A-235              | O_1 Status: TPD3  |   |      | ON                              | ON                     |                        |
| 3A-1-A-236              | O_2 Status: TPD7  |   |      | ON                              | ON                     |                        |
| 3A-1-A-237              | O_3 Status: JPD_N   |   |      | ON                              | ON                     |                        |
| 3A-1-A-238              | O_4 Status: SPD1_N  |   |      | ON                              | ON                     |                        |
| 3A-1-A-239              | O_5 Status: UGPD_N  |   |      | ON                              | ON                     |                        |
| 3A-1-A-240              | O_6 Status: SPD0_R  |   |      | OFF                             | OFF                    |                        |
| 3A-1-A-241              | O_7 Status: TPD1_R  |   |      | ON                              | ON                     |                        |
| 3A-1-A-242              | O_8 Status: TTPD_R  |   |      | ON                              | ON                     |                        |
| 3A-1-A-243              | Set the CAN BUS board address to 31   |   |      | 31                              | 31                     |                        |
| 3A-1-A-244              | Select "CAN BUS I/F Side" to B  |   |      | B                               | B                      |                        |
| 3A-1-A-245              | Click on Read All command in Digital Readout column   |   |      | OK                              | OK                     |                        |
| 3A-1-A-246              | Verify the status of the following flags:<br>BOARD STATUS   |   |      | NOK                             | NOK                    |                        |
| 3A-1-A-247              | OVT Alarm   |   |      | OK                              | OK                     |                        |
| 3A-1-A-248              | O_1 Status: TPD3  |   |      | ON                              | ON                     |                        |
| 3A-1-A-249              | O_2 Status: TPD7  |   |      | ON                              | ON                     |                        |
| 3A-1-A-250              | O_3 Status: JPD_N   |   |      | ON                              | ON                     |                        |
| 3A-1-A-251              | O_4 Status: SPD1_N  |   |      | OFF                             | OFF                    |                        |
| 3A-1-A-252              | O_5 Status: UGPD_N  |   |      | ON                              | ON                     |                        |
| DATE: 10.06.09          | TEST CONDUCTOR  | QA  |      |                                 |                        | CUSTOMER               |

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| CARLO GAVAZZI           |  | AMS02-PDS                                    |                 | N° Doc: PDS-PR-CGS-006   | N° Doc: PDS-RP-CGS-072   |
|-------------------------|--|--|-----------------|--------------------------|--|
| CARLO GAVAZZI SPACE SpA |  | AMS02-PDS PFM FULL FUNCTIONAL TEST REPORT    |                 | Doc N°: 2                | Doc N°: 1  |
| UUT DATA :              | Model PFM  | Item AMS02 POWER DISTRIBUTION SYSTEM         | C.I. PDS 18     | Date: 10/06/2009         | Date: 27/06/2009   |
| STEP n°                 | TEST SEQUENCE  |  |                 | TEST PROCEDURE REFERENCE | TEST REPORT REFERENCE  |
|                         |  |  |                 | SIN                      | FM01   |
|                         | O_6 Status: SPDO_R<br>O_7 Status: TPPD1<br>O_8 Status: TPPD_R              |  |                 | EXPECTED VALUE           | MEASURED VALUE   |
| 3A-1-A.237              | Set OFF in the window All Outlets ON/OFF and push the relative "W" command |  | OFF             | OFF                      | ON   |
| 3A-1-A.238              | Disconnect the short circuit simulator from outlet cables                  |  | ON              | ON                       | ON   |
| 3A-1-A.239              | Disconnect current probe   |  | OK              | OK                       | OK   |
| 3A-1-A.240              | Connect outlet cables to active load                                       |  | OK              | OK                       | OK   |
| 3A-1-A.241              | Set ON in All outlets ON/OFF command and push on the relative "W" command  |  | OK              | OK                       | OK   |
| 3A-1-A.242              | Verify the status of the following flags:<br>BOARD STATUS<br>OVT Alarm     | From O_1 Status: TPPD3 to O_8 Status: TPPD_R | OK<br>OK<br>ON  | OK<br>OK<br>ON           | OK<br>OK<br>ON   |
| 3A-1-A.243              | Set the CAN BUS board address to 30  |  | 30              | 30                       | In order to verify that CAN BUS 30 is able to reset a protection |
| 3A-1-A.244              | Select "CAN BUS I/F Side" to A   |  | A               | A                        |  |
| 3A-1-A.245              | Set OFF in the window All Outlets ON/OFF and push the relative "W" command |  | OK              | OK                       |  |
| 3A-1-A.246              | Click on Read All command in Digital Readout column                        |  | OK              | OK                       |  |
| 3A-1-A.247              | Verify the status of the following flags:<br>BOARD STATUS<br>OVT Alarm     | From O_1 Status: TPPD3 to O_8 Status: TPPD_R | OK<br>OK<br>OFF | OK<br>OK<br>OFF          |  |
| 3A-1-A.248              | Set ON in All outlets ON/OFF command and push on the relative "W" command  |  | OK              | OK                       |  |
| 3A-1-A.249              | Click on Read All command in Digital Readout column                        |  | OK              | OK                       |  |
| 3A-1-A.250              | Verify the status of the following flags:<br>BOARD STATUS<br>OVT Alarm     | From O_1 Status: TPPD3 to O_8 Status: TPPD_R | OK<br>OK<br>ON  | OK<br>OK<br>ON           |  |
| 3A-1-A.251              | Set OFF in the window All Outlets ON/OFF and push the relative "W" command |  | OK              | OK                       |  |

QA

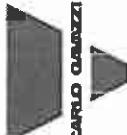
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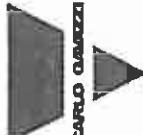
|   |                  |           |   |   |   |   |
|---|------------------|-----------|---|---|---|---|
|  | <b>AMS02-PDS</b> |           | N° Doc:<br>Doc Nr.:<br>Ediz.:<br>Issue:<br>Pagina<br>Page | PDS-PR-CGS-006<br>Data:<br>Date:<br>10/06/2009<br>di<br>370 | N° Doc:<br>Doc Nr.:<br>Ediz.:<br>Issue:<br>Pagina<br>Page | PDS-RP-CGS-072<br>Data:<br>Date:<br>27/06/2009<br>di<br>370 |
|   | UUT DATA :       | Model PFM | Item AMS02 POWER DISTRIBUTION SYSTEM                      | C.I.  | PDS 18  | S/N   |
| STEP n°   | TEST SEQUENCE    |           |   |   |   |   |

### 10.3.1.5.4.7 ESEM 3A-1 OUT 7 CURRENT LIMITERS

| 3A-1-A.252 | Click on Read All command in Digital Readout column<br>Verify the status of the following flags:<br>BOARD STATUS                    | OK             | OK    | OK            | OK     | OK       |
|------------|---|----------------|-------|---------------|--------|----------|
| 3A-1-A.253 | OVT Alarm<br>From O_1 CMD: TPD3 to O_8 CMD: TTPD_R<br>From O_1 Status: TPD3 to O_8 Status: TTPD_R                                   | OK             | OK    | OFF           | OFF    | OFF      |
| 3A-1-A.254 | Disconnect outlet cables  | OK             | OK    | OK            | OK     | OK       |
| 3A-1-A.255 | Connect outlet cables to short circuit simulator without amperometer  | OK             | OK    | OK            | OK     | OK       |
| 3A-1-A.256 | Set short circuit simulator to 3ms  | OK             | OK    | OK            | OK     | OK       |
| 3A-1-A.257 | Set ON in All outlets ON/OFF command and push on the relative "W" command   | OK             | OK    | OK            | OK     | OK       |
| 3A-1-A.258 | Click on Read all in Digital readout column and verify from outlet status located in Digital readout column that all outlets are on | OK             | OK    | OK            | OK     | OK       |
| 3A-1-A.259 | Create short circuit pressing start button on short circuit simulator   | OK             | OK    | OK            | OK     | OK       |
| 3A-1-A.260 | Verify the status of the following flags:<br>BOARD STATUS   | OK             | OK    | OK            | OK     | OK       |
| 3A-1-A.261 | Click on Read all in Digital readout column and verify from outlet status located in Digital readout column that all outlets are on | OK             | OK    | OK            | OK     | OK       |
| 3A-1-A.262 | Set short circuit simulator to 10ms short circuit duration  | OK             | OK    | OK            | OK     | OK       |
| 3A-1-A.263 | Monitor the short circuit current with a current probe (Ch1 of oscilloscope)  | OK             | OK    | OK            | OK     | OK       |
| 3A-1-A.264 | Monitor the 28V of a different outlet of Esem3A under test (Ch2 of oscilloscope)  | OK             | OK    | OK            | OK     | OK       |
| 3A-1-A.265 | Create the short circuit pressing start button on short circuit simulator   | OK             | OK    | OK            | OK     | OK       |
| 3A-1-A.266 | Make an hardcopy of the oscilloscope measurements   | OK             | OK    | OK            | OK     | OK       |
| 3A-1-A.267 | Measure in the previous picture the current limitation value  | 6.50A±10%      | 6.57A | 5ms<T lim<6ms | 5.14ms |          |
| 3A-1-A.268 | Verify with multimeter the absence of output voltage across load 7  | 0.00V±1.00V    | 0.00V | OK            | OK     |          |
| 3A-1-A.269 | Click on Read All command in Digital Readout column   |                |       |               |        |          |
|            | Verify the status of the following flags:<br>BOARD STATUS   | NOK            | NOK   | OK            | OK     |          |
|            | OVT Alarm   | OK             | OK    | ON            | ON     |          |
| 3A-1-A.270 | O_1 Status: TPD3  | ON             | ON    | ON            | ON     |          |
|            | O_2 Status: TPD7  | ON             | ON    | ON            | ON     |          |
|            | O_3 Status: JPD_N   | ON             | ON    | ON            | ON     |          |
|            | O_4 Status: SPD1_N  | ON             | ON    | ON            | ON     |          |
|            | O_5 Status: UGPD_N  | ON             | ON    | ON            | ON     |          |
|            | O_6 Status: SPDO_R  | ON             | ON    | ON            | ON     |          |
| DATE:      | 10.06.09  | TEST CONDUCTOR | QA    |               |        | CUSTOMER |

|  <b>CARLO GAVAZZI</b><br><b>CARLO GAVAZZI SPACE SPA</b> |  | <h1 style="text-align: center;">AMS02-PDS</h1> <p style="text-align: center;">AMS02-PDS PFM FULL FUNCTIONAL TEST REPORT</p> |   | N° Doc: PDS-PR-CGS-006<br>Doc N°: 2<br>Ediz.: 10/06/2009<br>Issue: Pagina 68 di 370 |             | N° Doc: PDS-RP-CGS-072<br>Doc N°: 1<br>Ediz.: 1<br>Issue: Pagina 68 di 370 |  |
|--|--|---|---|---|-------------|--|--|
| STEP n°  | TEST SEQUENCE  | UUT DATA:   | Model PFM   | Item AMS02 POWER DISTRIBUTION SYSTEM  | C.I. PDS 18 |  | TEST PROCEDURE REFERENCE S/N FM01                                |
|  | <p>O_7 Status: TPD1</p> <p>O_8 Status: TTPD_R</p>  |   |   |   | OFF         | ON   | OFF ON   |
| 3A-1-A-271   | Set the CAN BUS board address to 31  |   |   |   | 31          | 31   |  |
| 3A-1-A-272   | Select "CAN BUS I/F Side" to B   |   |   |   | B           | B  |  |
| 3A-1-A-273   | Click on Read All command in Digital Readout column  |   |   |   | OK          | OK   | OK   |
|  | Verify the status of the following flags:  |   |   |   | NOK         | OK   | NOK OK   |
|  | BOARD STATUS   |   |   |   | OK          | ON   | OK ON  |
|  | OVT Alarm  |   |   |   | ON          | ON   | ON ON  |
|  | O_1 Status: TPD3   |   |   |   | ON          | ON   | ON ON  |
|  | O_2 Status: TPD7   |   |   |   | ON          | ON   | ON ON  |
|  | O_3 Status: JPD_N  |   |   |   | ON          | ON   | ON ON  |
|  | O_4 Status: SPD1_N   |   |   |   | ON          | ON   | ON ON  |
|  | O_5 Status: UGPD_N   |   |   |   | ON          | ON   | ON ON  |
|  | O_6 Status: SPD0_R   |   |   |   | OFF         | OFF  | OFF OFF  |
|  | O_7 Status: TPD1_R   |   |   |   | ON          | ON   | ON ON  |
|  | O_8 Status: TTPD_R   |   |   |   | ON          | ON   | ON ON  |
| 3A-1-A-275   | Set OFF in the window All Outlets ON/OFF and push the relative "W" command                           |   |   |   | OK          | OK   | Protection reset   |
| 3A-1-A-276   | Disconnect the short circuit simulator from outlet cables  |   |   |   | OK          | OK   |  |
| 3A-1-A-277   | Disconnect current probe   |   |   |   | OK          | OK   |  |
| 3A-1-A-278   | Connect outlet cables to active load   |   |   |   | OK          | OK   |  |
| 3A-1-A-279   | Set ON in All outlets ON/OFF command and push on the relative "W" command                            |   |   |   | OK          | OK   |  |
|  | Verify the status of the following flags:  |   |   |   | OK          | OK   |  |
|  | BOARD STATUS   |   |   |   | OK          | OK   |  |
|  | OVT Alarm  |   |   |   | OK          | OK   |  |
|  | From O_1 Status: TPD3 to O_8 Status: TTPD_R  |   |   |   | ON          | ON   |  |
| 3A-1-A-281   | Set the CAN BUS board address to 30  |   |   |   | 30          | 30   | In order to verify that CAN BUS 30 is able to reset a protection |
| 3A-1-A-282   | Select "CAN BUS I/F Side" to A   |   |   |   | A           | A  |  |
| 3A-1-A-283   | Set OFF in the window All Outlets ON/OFF and push the relative "W" command                           |   |   |   | OK          | OK   |  |
| 3A-1-A-284   | Click on Read All command in Digital Readout column  |   |   |   | OK          | OK   |  |
|  | Verify the status of the following flags:  |   |   |   |             |  |  |
|  | BOARD STATUS   |   |   |   | OK          | OK   |  |
|  | OVT Alarm  |   |   |   | OK          | OK   |  |
|  | From O_1 Status: TPD3 to O_8 Status: TTPD_R  |   |   |   | OFF         | OFF  |  |
| 3A-1-A-286   | Set ON in All outlets ON/OFF command and push on the relative "W" command                            |   |   |   | OK          | OK   |  |
| 3A-1-A-287   | Click on Read All command in Digital Readout column  |   |   |   | OK          | OK   |  |
| 3A-1-A-288   | Verify the status of the following flags:  |   |   |   | OK          | OK   |  |
| DATE: 10.06.09   | TEST CONDUCTOR  | QA  | <br>CUSTOMER |   |             |  |  |

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|  | <b>AMS02-PDS</b> |   | N° Doc:<br>Doc N°:<br>Ediz.:<br>Issue: | PDS-PR-CGS-006<br>2<br>Data:<br>Date:<br>10/06/2009 | N° Doc:<br>Doc N°:<br>Ediz.:<br>Issue: | PDS-RP-CGS-072<br>1<br>Data:<br>Date:<br>27/06/2009 |                       |
| CARLO GAVAZZI SPACE SpA   |                  | AMS02-PDS PFM FULL FUNCTIONAL TEST REPORT |  | Pagina<br>Page                                      | 69<br>di<br>370<br>of                  | Pagina<br>Page                                      | 69<br>di<br>370<br>of |
| UUT DATA :  | Model            | PFM                                       | Item                                   | AMS02 POWER DISTRIBUTION SYSTEM                     | C.I.                                   | PDS 18  |                       |
| STEP n°   | TEST SEQUENCE    |   |  |   | EXPECTED<br>VALUE                      | MEASURED<br>VALUE                                   |                       |

3A-1-A-289 Set OFF in the window All Outlets ON/OFF and push the relative "W" command

#### 10.3.1.5.4.8 ESEM 3A-1 OUT 8 CURRENT LIMITERS

| 3A-1-A-290 Click on Read All command in Digital Readout column   |                | TEST PROCEDURE REFERENCE |        | TEST REPORT REFERENCE |                                    |
|--|----------------|--------------------------|--------|-----------------------|------------------------------------|
| STEP n°  | TEST CONDUCTOR | S/N                      | FM01   | S/N                   | CUSTOMER                           |
| 3A-1-A-291 Verify the status of the following flags:<br>BOARD STATUS<br>OVT Alarm  |                | OK                       | OK     | OK                    | OK                                 |
| 3A-1-A-292 From O_1 CMD: TPD3 to O_8 CMD: TPPD_R<br>From O_1 Status: TPD3 to O_8 Status: TPPD_R  |                | OK                       | OK     | OK                    | OK                                 |
| 3A-1-A-293 Disconnect outlet cables  |                | OFF                      | OFF    | OFF                   | OFF                                |
| 3A-1-A-294 Connect outlet cables to short circuit simulator without ammeter  |                | OK                       | OK     | OK                    | OK                                 |
| 3A-1-A-295 Set short circuit simulator to 3ms  |                | OK                       | OK     | OK                    | OK                                 |
| 3A-1-A-296 Set ON in All outlets ON/OFF command and push on the relative "W" command   |                | OK                       | OK     | OK                    | OK                                 |
| 3A-1-A-297 Click on Read all in Digital readout column and verify from outlet status located in Digital readout column that all outlets are on |                | OK                       | OK     | OK                    | OK                                 |
| 3A-1-A-298 Create short circuit pressing start button on short circuit simulator   |                | OK                       | OK     | OK                    | OK                                 |
| 3A-1-A-299 Verify the status of the following flags:<br>BOARD STATUS   |                | OK                       | OK     | OK                    | OK                                 |
| 3A-1-A-300 Click on Read all in Digital readout column and verify from outlet status located in Digital readout column that all outlets are on |                | OK                       | OK     | OK                    | OK                                 |
| 3A-1-A-301 Set short circuit simulator to 10ms short circuit duration  |                | OK                       | OK     | OK                    | OK                                 |
| 3A-1-A-302 Monitor the short circuit current with a current probe (Ch1 of oscilloscope)  |                | OK                       | OK     | OK                    | OK                                 |
| 3A-1-A-303 Create the short circuit pressing start button on short circuit simulator   |                | OK                       | OK     | OK                    | OK                                 |
| 3A-1-A-304 Make an hardcopy of the oscilloscope measurements   |                | OK                       | OK     | OK                    | Add Annex 8 in the end of document |
| 3A-1-A-305 Measure in the previous picture the current limitation value  |                | 13,00±1,0%               | 12,60A |                       |                                    |
| 3A-1-A-306 Measure in previous picture the current limitation time   |                | 5ms<T limit<6ms          | 5,17ms |                       |                                    |
| 3A-1-A-307 Verify with multimeter the absence of output voltage across load 8  |                | 0,00V±1,00V              | 0,00V  | OK                    |                                    |
| 3A-1-A-308 Verify the status of the following flags:<br>BOARD STATUS<br>OVT Alarm  |                | NOK                      | NOK    | OK                    |                                    |

DATE: 10.06.09 TEST CONDUCTOR  QA 

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| CARLO GAVAZZI   |                               | AMS02-PDS                                      |      | N° Doc:<br>Doc N°:<br>Ediz.:<br>Issue:   |  | N° Doc:<br>Doc N°:<br>Ediz.:<br>Issue:   |  |
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| CARLO GAVAZZI SPACE SpA   |                               | AMS02-PDS PFM FULL FUNCTIONAL TEST REPORT      |      | PDS-PR-CGS-006<br>Data:<br>Date:<br>2<br>10/06/2009<br>Pagina<br>Page<br>70<br>di<br>370 |  | PDS-RP-CGS-072<br>Data:<br>Date:<br>1<br>27/06/2009<br>Pagina<br>Page<br>70<br>di<br>370 |  |
| UTT DATA :  |                               | Model PFM Item AMS02 POWER DISTRIBUTION SYSTEM |      | TEST PROCEDURE REFERENCE   |  | TEST REPORT REFERENCE  |  |
| STEP n°   | TEST SEQUENCE                 |  | C.I. | PDS 18   | EXPECTED VALUE   | MEASURED VALUE   | REMARKS  |
| O_1 Status: TPD3<br>O_2 Status: TPD7<br>O_3 Status: JPD_N<br>O_4 Status: SPD1_N<br>O_5 Status: UGPD_N<br>O_6 Status: SPD0_R<br>O_7 Status: TPD1<br>O_8 Status: TTPD_R |                               |  |      |  | ON<br>ON<br>ON<br>ON<br>ON<br>ON<br>OFF                    | ON<br>ON<br>ON<br>ON<br>ON<br>ON<br>OFF  | ON<br>ON<br>ON<br>ON<br>ON<br>ON<br>OFF                          |
| 3A-1-A-309 Set the CAN BUS board address to 31  |                               |  |      |  |  | 31   | 31   |
| 3A-1-A-310 Select "CAN BUS I/F Side" to B   |                               |  |      |  | B  | B  |  |
| 3A-1-A-311 Click on Read All command in Digital Readout column  |                               |  |      |  | OK   | OK   |  |
| Verify the status of the following flags:<br>BOARD STATUS   |                               |  |      |  | NOK<br>OK<br>ON<br>ON<br>ON<br>ON<br>ON<br>ON<br>OFF<br>ON | NOK<br>OK<br>OK<br>ON<br>ON<br>ON<br>ON<br>ON<br>ON<br>OFF<br>ON                         | NOK<br>OK<br>OK<br>ON<br>ON<br>ON<br>ON<br>ON<br>ON<br>OFF<br>ON |
| OVT Alarm   |                               |  |      |  |  |  |  |
| O_1 Status: TPD3<br>O_2 Status: TPD7<br>O_3 Status: JPD_N<br>O_4 Status: SPD1_N<br>O_5 Status: UGPD_N<br>O_6 Status: SPD0_R<br>O_7 Status: TPD1<br>O_8 Status: TTPD_R |                               |  |      |  |  |  |  |
| 3A-1-A-312  |                               |  |      |  |  |  |  |
| 3A-1-A-313 Set OFF in the window All Outlets ON/OFF and push the relative "W" command   |                               |  |      |  | OK   | OK   |  |
| 3A-1-A-314 Disconnect the short circuit simulator from outlet cables  |                               |  |      |  | OK   | OK   |  |
| 3A-1-A-315 Disconnect current probe   |                               |  |      |  | OK   | OK   |  |
| 3A-1-A-316 Connect outlet cables to active load   |                               |  |      |  | OK   | OK   |  |
| 3A-1-A-317 Set ON in All outlets ON/OFF command and push on the relative "W" command  |                               |  |      |  | OK   | OK   |  |
| 3A-1-A-318 Verify the status of the following flags:<br>BOARD STATUS  |                               |  |      |  | OK<br>OK<br>ON   | OK<br>OK<br>ON   |  |
| From O_1 Status: TPD3 to O_8 Status: TTPD_R   |                               |  |      |  |  |  |  |
| 3A-1-A-319 Set the CAN BUS board address to 30  |                               |  |      |  | 30   | 30   |  |
| 3A-1-A-320 Select "CAN BUS I/F Side" to A   |                               |  |      |  | A  | A  |  |
| 3A-1-A-321 Set OFF in the window All Outlets ON/OFF and push the relative "W" command   |                               |  |      |  | OK   | OK   |  |
| 3A-1-A-322 Click on Read All command in Digital Readout column  |                               |  |      |  | OK   | OK   |  |
| 3A-1-A-323 Verify the status of the following flags:  |                               |  |      |  |  |  |  |
| DATE: 10.06.09  | TEST CONDUCTOR <i>Jf 2012</i> |  | QA   | <i>✓</i>   |  | CUSTOMER   |  |

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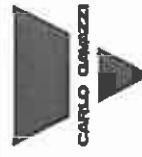
| <br><b>CARLO GAVAZZI</b><br>CARLO GAVAZZI SPACE SpA |   | <h1 style="text-align: center;"><b>AMS02-PDS</b></h1> <p style="text-align: center;">AMS02-PDS PFM FULL FUNCTIONAL TEST REPORT</p> |                                       | <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%;">N° Doc:<br/>Doc N°:<br/>Ediz.:<br/>Issue:</td><td style="width: 30%;">PDS-PR-CGS-006<br/>2<br/>Data:<br/>Date:</td><td style="width: 30%;">N° Doc:<br/>Doc N°:<br/>Ediz.:<br/>Issue:</td><td style="width: 30%;">PDS-RP-CGS-072<br/>1<br/>Data:<br/>Date:</td></tr> <tr> <td>Pagina<br/>Page</td><td>71<br/>di<br/>370</td><td>Pagina<br/>Page</td><td>71<br/>di<br/>370</td></tr> </table> |                | N° Doc:<br>Doc N°:<br>Ediz.:<br>Issue: | PDS-PR-CGS-006<br>2<br>Data:<br>Date: | N° Doc:<br>Doc N°:<br>Ediz.:<br>Issue: | PDS-RP-CGS-072<br>1<br>Data:<br>Date: | Pagina<br>Page | 71<br>di<br>370 | Pagina<br>Page | 71<br>di<br>370 |
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| N° Doc:<br>Doc N°:<br>Ediz.:<br>Issue:   | PDS-PR-CGS-006<br>2<br>Data:<br>Date:   | N° Doc:<br>Doc N°:<br>Ediz.:<br>Issue:   | PDS-RP-CGS-072<br>1<br>Data:<br>Date: |   |                |  |                                       |  |                                       |                |                 |                |                 |
| Pagina<br>Page   | 71<br>di<br>370   | Pagina<br>Page   | 71<br>di<br>370                       |   |                |  |                                       |  |                                       |                |                 |                |                 |
| <b>UUT DATA :</b> Model : PFM      Item : AMS02 POWER DISTRIBUTION SYSTEM  |   |  | C.I. : PDS 18                         | TEST PROCEDURE REFERENCE  |                |  |                                       |  |                                       |                |                 |                |                 |
| STEP n°  | TEST SEQUENCE   |  |                                       | S/N   | FM01           |  |                                       |  |                                       |                |                 |                |                 |
| STEP n°  | TEST SEQUENCE   |  |                                       | EXPECTED VALUE  | MEASURED VALUE |  |                                       |  |                                       |                |                 |                |                 |
|  | BOARD STATUS  |  |                                       | OK  | OK             |  |                                       |  |                                       |                |                 |                |                 |
| 3A-1-A-324   | From O_1 Status: TPPD3 to O_8 Status: TPPD_R<br>Set ON in All outlets ON/OFF command and push on the relative "W" command               |  |                                       | OK  | OK             |  |                                       |  |                                       |                |                 |                |                 |
| 3A-1-A-325   | Click on Read All command in Digital Readout column<br>Verify the status of the following flags:  |  |                                       | OK  | OK             |  |                                       |  |                                       |                |                 |                |                 |
| 3A-1-A-326   | BOARD STATUS  |  |                                       | OK  | OK             |  |                                       |  |                                       |                |                 |                |                 |
| 3A-1-A-327   | OVT Alarm<br>From O_1 Status: TPPD3 to O_8 Status: TPPD_R<br>Set OFF in the window All Outlets ON/OFF and push the relative "W" command |  |                                       | ON  | ON             |  |                                       |  |                                       |                |                 |                |                 |
| 3A-1-A-328   | Switch OFF main power bus   |  |                                       | OK  | OK             |  |                                       |  |                                       |                |                 |                |                 |
|  |   |  |                                       | OFF   | OFF            |  |                                       |  |                                       |                |                 |                |                 |

DATE: 10.06.09

TEST CONDUCTOR *PAUL*

QA

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| <br><b>CARLO GAVAZZI</b> | <h1 style="text-align: center;">AMS02-PDS</h1>   |                | <p>N° Doc: <b>PDS-PR-CGS-006</b></p> <p>Doc N°: <b>1</b></p> <p>Ediz.: <b>1</b></p> <p>Date: <b>10/06/2009</b></p> <p>Issue: <b>1</b></p> <p>Data: <b>27/06/2009</b></p> |                                 | <p>N° Doc: <b>PDS-RP-CGS-072</b></p> <p>Doc N°: <b>1</b></p> <p>Ediz.: <b>1</b></p> <p>Date: <b>27/06/2009</b></p> <p>Issue: <b>1</b></p> <p>Data: <b>27/06/2009</b></p> |  |
|---|--|----------------|--|---------------------------------|--|--|
|   | <p>AMS02-PDS PFM FULL FUNCTIONAL TEST REPORT</p>                                       |                | <p>Pagina <b>72</b> di <b>370</b></p>  |                                 | <p>Pagina <b>72</b> di <b>370</b> of</p>   |  |
| UUT DATA :  | Model  | PFM            | Item   | AMS02 POWER DISTRIBUTION SYSTEM | C.I.   | TEST PROCEDURE REFERENCE                       |
| STEP n°   | TEST SEQUENCE  |                | S/N  | TEST REPORT REFERENCE           |  |  |
|   |  |                |  | PDS 18                          | FM01   |  |
| STEP n°   | TEST SEQUENCE  |                |  | C.I.                            | EXPECTED VALUE   | MEASURED VALUE                                 |
| UUT DATA :  | Model  | PFM            | Item   | AMS02 POWER DISTRIBUTION SYSTEM | REMARKS  |  |
| 10.3.1.5.5 PB2-2 SIDE A   |  |                |  |                                 |  |  |
| PB2-2-A.1   | Connect AI 120V and AI 120V RTN power supply signals                                   |                |  | OK                              | OK   | OK   |
| PB2-2-A.2   | Verify that all the cables of the section are connected                                |                |  | OK                              | OK   | OK   |
| PB2-2-A.3   | Launch the PDS controller software   |                |  | Program open                    | Program open   |  |
| PB2-2-A.4   | Set to "FM" the window Model   |                |  | OK                              | OK   |  |
| PB2-2-A.5   | set the CAN BUS board address to 30  |                |  | 30                              | 30   |  |
| PB2-2-A.6   | select JMDC = 0  |                |  | 0                               | 0  |  |
| PB2-2-A.7   | select TX = A  |                |  | A                               | A  | A  |
| PB2-2-A.8   | select RX = A  |                |  | A                               | A  | A  |
| PB2-2-A.9   | Select "CAN BUS I/F Side" to A   |                |  | A                               | A  | A  |
| PB2-2-A.10  | Select "PDS Side" to A   |                |  | A                               | A  | A  |
| PB2-2-A.11  | Set input bus voltage to 120V  |                |  | 120V±1V                         | 120V   |  |
| PB2-2-A.12  | Set input bus current limitation to 27,5 A   |                |  | 27,5 A±1A                       | 27,5 A   |  |
| PB2-2-A.13  | Enable power supply output   |                |  | enabled                         | enabled  |  |
| PB2-2-A.14  | Verify that green led of "power switch box" is lighted                                 |                |  | Green led lighted               | Green led lighted  |  |
| PB2-2-A.15  | Switch ON the "power switch box"   |                |  | Switch ON                       | Switch ON  |  |
| PB2-2-A.16  | Verify that red led of "power switch box" is lighted                                   |                |  | Red led lighted                 | Red led lighted  |  |
| PB2-2-A.17  | Take note of power supply output current   |                |  | 1,1A±0,5A                       | 1,1A   |  |
| PB2-2-A.18  | Click on Run flash button  |                |  | OK                              | OK   |  |
| PB2-2-A.19  | Set the CAN BUS board address to 31  |                |  | 31                              | 31   |  |
| PB2-2-A.20  | Select "CAN BUS I/F Side" to B   |                |  | B                               | B  |  |
| PB2-2-A.21  | Click on Run flash button  |                |  | OK                              | OK   |  |
| PB2-2-A.22  | Set the CAN BUS board address to 30  |                |  | 30                              | 30   |  |
| PB2-2-A.23  | Select "CAN BUS I/F Side" to A   |                |  | A                               | A  |  |
| PB2-2-A.24  | Click on PB2-2 button  |                |  | OK                              | OK   | This board is default OFF                      |
| PB2-2-A.25  | Set Digital I/F Test logic value = 1 in "Commanding" column                            |                |  | 1                               | 1  | Button located on left side of software window |
| PB2-2-A.26  | Click on letter "W" on the right of the "1" value                                      |                |  | OK                              | OK   |  |
| PB2-2-A.27  | Click on the command READ ALL under the column Digital Readout                         |                |  | OK                              | OK   |  |
| PB2-2-A.28  | Verify that in the column Digital Readout under the voice Digital I/F Test appears "1" |                |  | 1                               | 1  |  |
| PB2-2-A.29  | Set Digital I/F Test logic value = 0 in "Commanding" column                            |                |  | 0                               | 0  |  |
| PB2-2-A.30  | Click on letter "W" on the right of the "0" value                                      |                |  | OK                              | OK   |  |
| PB2-2-A.31  | Click on the command READ ALL under the column Digital Readout                         |                |  | OK                              | OK   |  |
| PB2-2-A.32  | Verify that in the column Digital Readout under the voice Digital I/F Test appears "0" |                |  | 0                               | 0  |  |
| PB2-2-A.33  | Click on the command READ ALL under the column Digital Readout                         |                |  | OK                              | OK   |  |
| PB2-2-A.34  | Verify the status of the following flags:  |                |  |                                 |  |  |
| DATE:   | 11.06.09   | TEST CONDUCTOR | QA   |                                 |  | CUSTOMER                                       |

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| AMS02-PDS               |  | N° Doc: PDS-PR-CGS-006<br>Doc N°: 2<br>Ediz.: Data: 10/06/2009<br>Issue: Pagina 73 di 370 |      | N° Doc: PDS-RP-CGS-072<br>Doc N°: 1<br>Ediz.: Data: 27/06/2009<br>Issue: Pagina 73 di 370 |          |
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| CARLO GAVAZZI SPACE SpA |  | AMS02-PDS PFM FULL FUNCTIONAL TEST REPORT   |      | TEST PROCEDURE REFERENCE  |          |
| UUT DATA :              | Model  | PFM   | Item | AMS02 POWER DISTRIBUTION SYSTEM   | C.I.     |
| STEP n°                 | TEST SEQUENCE  |   |      | S/N   | S/N      |
|                         | BOARD STATUS   |   |      |   |          |
|                         | OVT ALARM  |   |      | OK  | OK       |
|                         | Input OVC Alarm  |   |      | OK  | OK       |
|                         | DCDC ON/OFF  |   |      | OFF   | OFF      |
|                         | 27V UV   |   |      | OK  | OK       |
|                         | 29V Trip   |   |      | OK  | OK       |
|                         | DCDC OFF/ON CMD  |   |      | OFF   | OFF      |
| PB2-2-A.35              | Click on the command READ ALL under the column Analog Readout                              |   |      | OK  | OK       |
|                         | Verify the value of the following telemetries:   |   |      |   |          |
| PB2-2-A.36              | Temperature  |   |      | -40°C < T < 80°C  | 24,8°C   |
|                         | Output Voltage   |   |      | 0,00V ±1,00V  | -0,167V  |
|                         | Analog Ref. 2,0V   |   |      | 2,000V ±150mV   | 2,091V   |
| PB2-2-A.37              | Set the CAN BUS board address to 31  |   |      | 31  | 31       |
| PB2-2-A.38              | Select "CAN BUS IF Side" to B  |   |      | B   | B        |
| PB2-2-A.39              | Click on the command READ ALL under the column Digital Readout                             |   |      | OK  | OK       |
|                         | Verify the status of the following flags:  |   |      |   |          |
| PB2-2-A.40              | BOARD STATUS   |   |      | OK  | OK       |
|                         | OVT ALARM  |   |      | OK  | OK       |
|                         | Input OVC Alarm  |   |      | OK  | OK       |
|                         | DCDC ON/OFF  |   |      | OFF   | OFF      |
|                         | 27V UNV  |   |      | OK  | OK       |
|                         | 29V Trip   |   |      | OK  | OK       |
|                         | DCDC OFF/ON CMD  |   |      | OFF   | OFF      |
| PB2-2-A.41              | Set ON on DCDC OFF/ON command window and send the command                                  |   |      | OK  | OK       |
| PB2-2-A.42              | Click on the command READ ALL under the column Digital Readout                             |   |      | OK  | OK       |
|                         | Verify the status of the following flags:  |   |      |   |          |
| PB2-2-A.43              | BOARD STATUS   |   |      | OK  | OK       |
|                         | OVT ALARM  |   |      | OK  | OK       |
|                         | Input OVC Alarm  |   |      | OK  | OK       |
|                         | DCDC ON/OFF  |   |      | ON  | ON       |
|                         | 27V UNV  |   |      | OK  | OK       |
|                         | 29V Trip   |   |      | ON  | ON       |
|                         | DCDC OFF/ON CMD  |   |      | OK  | OK       |
| PB2-2-A.44              | Click on ESEM 3A-2 button  |   |      | OK  | OK       |
| PB2-2-A.45              | Set ON in the window "O 1: ER1 N" and push the relative "W" command                        |   |      | OK  | OK       |
| PB2-2-A.46              | Measure with multimeter the voltage on ESEM 3-A 2 out 1 (Check that load is not connected) |   |      | 28,00V ±1,00V   | 28,11V   |
| PB2-2-A.47              | Click on PB2-2 button  |   |      | OK  | OK       |
| DATE: 11.06.09          | TEST CONDUCTOR   | QA  |      |   | CUSTOMER |

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| AMS02-PDS   |  | N° Doc:<br>Doc N°:<br>Ediz.:<br>Issue: | PDS-PR-CGS-006<br>Data:<br>Date:<br>Pagina<br>Page | N° Doc:<br>Doc N°:<br>Ediz.:<br>Issue:<br>Pagina<br>Page | PDS-RP-CGS-072<br>Data:<br>Date:<br>Pagina<br>Page |  |  |
|---|--|--|--|--|--|--|--|
| UUT DATA :  | Model PFM  | Item                                   | AMS02 POWER DISTRIBUTION SYSTEM                    | C.I.   | TEST PROCEDURE REFERENCE                           |  |  |
| STEP n°   | TEST SEQUENCE  |  |  |  | S/N FM01   |  |  |
| PB2-2-A.48  | Click on the command READ ALL under the column Analog Readout              |  |  | OK   | OK   |  |  |
| PB2-2-A.49  | Verify the value of the following telemetry:<br>Output Voltage             |  | V1±1.092V  | 27.096V  | Click on relative Rbutton                          |  |  |
| PB2-2-A.50  | Click on ESEM 3A-2 button  |  | OK   | OK   |  |  |  |
| PB2-2-A.51  | Set OFF in the window All Outlets ON/OFF and push the relative "W" command |  | OK   | OK   |  |  |  |
| PB2-2-A.52  | Set the CAN BUS board address to 30  |  | 30   | 30   |  |  |  |
| PB2-2-A.53  | Select "CAN BUS I/F Side" to A   |  | A  | A  |  |  |  |
| PB2-2-A.54  | Click on PB2-2 button  |  | OK   | OK   |  |  |  |
| PB2-2-A.55  | Click on the command READ ALL under the column Digital Readout             |  | OK   | OK   |  |  |  |
| Verify the status of the following flags:<br><br>BOARD STATUS |  |  |  |  |  |  |  |
| OVT ALARM   |  |  |  |  |  |  |  |
| Input OVC Alarm   |  |  |  |  |  |  |  |
| DCDC ON/OFF   |  |  |  |  |  |  |  |
| 27V UNV   |  |  |  |  |  |  |  |
| 29V Trip  |  |  |  |  |  |  |  |
| DCDC OFF/ON CMD   |  |  |  |  |  |  |  |

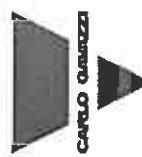
|  |                                |    |                    |          |
|--|--------------------------------|----|--------------------|----------|
| DATE: 11.06.09   | TEST CONDUCTOR <i>Giovanni</i> | QA | <i>[Signature]</i> | CUSTOMER |
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|  | <b>AMS02-PDS</b>                          |                                 |      |        |                          |                |         |                       |
|---|---|---------------------------------|------|--------|--------------------------|----------------|---------|-----------------------|
|   | AMS02-PDS PFM FULL FUNCTIONAL TEST REPORT |                                 |      |        |                          |                |         |                       |
| UUT DATA :  | Model                                     | PFM                             |      |        |                          |                |         |                       |
| STEP n°   | TEST SEQUENCE                             |                                 |      |        |                          |                |         |                       |
| UUT DATA :  | Model                                     | AMS02 POWER DISTRIBUTION SYSTEM | C.I. | PDS 18 | TEST PROCEDURE REFERENCE | S/N            | FM01    | TEST REPORT REFERENCE |
| STEP n°   | TEST SEQUENCE                             |                                 |      |        | EXPECTED VALUE           | MEASURED VALUE | REMARKS |                       |

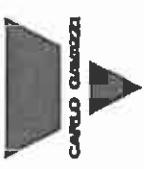
### 10.3.15.6 ESEM 3A-2 SIDE A

|                |  |               |         |         |         |         |         |  |
|----------------|--|---------------|---------|---------|---------|---------|---------|--|
| 3A-2-A.1       | Click on ESEM3-A2 button   | OK            | OK      | OK      | OK      | OK      | OK      | Button located on left side of software window |
| 3A-2-A.2       | Connect to active loads outlet 1, 2, 3, 4, 5, 6, 7 and 8.  | OK            | OK      | OK      | OK      | OK      | OK      |  |
| 3A-2-A.3       | Verify that loads are set to 0A current absorption   | OK            | OK      | OK      | OK      | OK      | OK      |  |
| 3A-2-A.4       | Set Digital I/F Test logic value = 1 in "Commanding" column  | 1             | 1       | 1       | 1       | 1       | 1       |  |
| 3A-2-A.5       | Click on letter "W" on the right of the "1" value  | OK            | OK      | OK      | OK      | OK      | OK      |  |
| 3A-2-A.6       | Click on the command READ ALL under the column Digital Readout                                       | OK            | OK      | OK      | OK      | OK      | OK      |  |
| 3A-2-A.7       | Verify that in the column Digital Readout under the voice Digital I/F Test appears "1"               | 1             | 1       | 1       | 1       | 1       | 1       |  |
| 3A-2-A.8       | Set Digital I/F Test logic value = 0 in "Commanding" column  | 0             | 0       | 0       | 0       | 0       | 0       |  |
| 3A-2-A.9       | Click on letter "W" on the right of the "0" value  | OK            | OK      | OK      | OK      | OK      | OK      |  |
| 3A-2-A.10      | Click on the command READ ALL under the column Digital Readout                                       | OK            | OK      | OK      | OK      | OK      | OK      |  |
| 3A-2-A.11      | Verify that in the column Digital Readout under the voice Digital I/F Test appears "0"               | 0             | 0       | 0       | 0       | 0       | 0       |  |
|                | Verify the status of the following flags:  |               |         |         |         |         |         |  |
| 3A-2-A.12      | OVT Alarm  | OK            | OK      | OK      | OK      | OK      | OK      |  |
|                | From O_1 CMD: ER1_N to O_8 CMD: CAB_R  | OFF           | OFF     | OFF     | OFF     | OFF     | OFF     |  |
|                | From O_1 Status: ER1_N to O_8 Status: CAB_R  | OK            | OK      | OK      | OK      | OK      | OK      |  |
| 3A-2-A.13      | Push on Read All button in Analog Readout column   |               |         |         |         |         |         |  |
|                | Verify the current telemetries:  |               |         |         |         |         |         |  |
|                | O_1 Current: ER1_N   | 0,000A±0,225A | 0,004V  | 0,004V  | 0,004V  | 0,004V  | 0,004V  |  |
|                | O_2 Current: TPD2  | 0,000A±0,225A | -0,005V | -0,005V | -0,005V | -0,005V | -0,005V |  |
|                | O_3 Current: TPD6  | 0,000A±0,225A | -0,010V | -0,010V | -0,010V | -0,010V | -0,010V |  |
|                | O_4 Current: SPD3_N  | 0,000A±0,225A | -0,040V | -0,040V | -0,040V | -0,040V | -0,040V |  |
|                | O_5 Current: MPD_N   | 0,000A±0,225A | 0,042V  | 0,042V  | 0,042V  | 0,042V  | 0,042V  |  |
|                | O_6 Current: UPD1  | 0,000A±0,225A | 0,016V  | 0,016V  | 0,016V  | 0,016V  | 0,016V  |  |
|                | O_7 Current: SPD2_N  | 0,000A±0,225A | -0,053V | -0,053V | -0,053V | -0,053V | -0,053V |  |
|                | O_8 Current: CAB_R   | 0,000A±0,45A  | -0,014V | -0,014V | -0,014V | -0,014V | -0,014V |  |
|                | Temperature  | -40°C-T<80°C  | 26,80°C | 26,80°C | 26,80°C | 26,80°C | 26,80°C |  |
|                | Analog Ref. 3.0V   | 3,000V±250mV  | 2,989V  | 2,989V  | 2,989V  | 2,989V  | 2,989V  |  |
|                | Measure with multimeter the voltage on this ESEM 3-A loads:  |               |         |         |         |         |         |  |
|                | O_1: ER1_N   | 0,00V<V<1,00V | 0,00V   | 0,00V   | 0,00V   | 0,00V   | 0,00V   |  |
|                | O_2: TPD2  | 0,00V<V<1,00V | 0,00V   | 0,00V   | 0,00V   | 0,00V   | 0,00V   |  |
|                | O_3: TPD6  | 0,00V<V<1,00V | 0,00V   | 0,00V   | 0,00V   | 0,00V   | 0,00V   |  |
|                | O_4: SPD3_N  | 0,00V<V<1,00V | 0,00V   | 0,00V   | 0,00V   | 0,00V   | 0,00V   |  |
|                | O_5: MPD_N   | 0,00V<V<1,00V | 0,00V   | 0,00V   | 0,00V   | 0,00V   | 0,00V   |  |
|                | O_6: UPD1  | 0,00V<V<1,00V | 0,00V   | 0,00V   | 0,00V   | 0,00V   | 0,00V   |  |
| DATE: 11.06.09 | TEST CONDUCTOR  | QA            |         |         |         |         |         |  |

|  |   |
|--|---|
| CUSTOMER<br>          | DATE: 27/06/2009<br>Ediz.: 1<br>Issue:<br>Pagina 75 di 370<br>Page 75 of 370                                    |
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|---|---|---|------|---|--|--|-----------------------|--|
| <p>AMS02-PDS PFM FULL FUNCTIONAL TEST REPORT</p>  |   | <p>TEST PROCEDURE REFERENCE</p>   |      |   |  |  |                       |  |
| UUT DATA :  | Model   | PFM   | Item | AMS02 POWER DISTRIBUTION SYSTEM   | C.I.   | PDS 18   | TEST REPORT REFERENCE |  |
| STEP n°   | TEST SEQUENCE   |   |      |   | EXPECTED VALUE   | MEASURED VALUE   | REMARKS               |  |
| 3A-2-A.16   | O_7: SPD2_N<br>O_8: CAB_R   | Set ON in the window All Outlets ON/OFF and push the relative "W" command |      | 0,00V<\>1,00V<br>0,00V<\>1,00V  | 0,00V<br>0,00V   | 0,00V<br>0,00V   | OK                    |  |
| 3A-2-A.17   | O_1: ER1_N<br>O_2: TPD2<br>O_3: TPD6<br>O_4: SPD3_N<br>O_5: MPD_N<br>O_6: UPD1<br>O_7: SPD2_N<br>O_8: CAB_R | Measure with multimeter the voltage on this ESEM 3-A loads:               |      | 28,00V±1,00V<br>28,00V±1,00V<br>28,00V±1,00V<br>28,00V±1,00V<br>28,00V±1,00V<br>28,00V±1,00V<br>28,00V±1,00V  | 28,16V<br>28,12V<br>28,15V<br>28,18V<br>28,16V<br>28,16V<br>28,16V |  | OK                    |  |
| 3A-2-A.18   | Click on Read All command in Digital Readout column   | Verify the status of the following flags:<br>BOARD STATUS<br>OVT Alarm    |      | OK  | OK   | OK   | OK                    |  |
| 3A-2-A.19   | From O_1 CMD: ER1_N to O_8 CMD: CAB_R<br>From O_1 Status: ER1_N to O_8 Status: CAB_R                        |   |      | OK  | OK   | OK   | OK                    |  |
| 3A-2-A.20   | Set Off in All outlets ON/OFF command and push on the relative "W" command                                  |   |      | ON  | ON   | ON   | ON                    |  |
| 3A-2-A.21   | Click on Raed all to in Digital readout column  |   |      | OK  | OK   | OK   | OK                    |  |
| 3A-2-A.22   | Verify from digital readout column that all outlets are OFF   |   |      | OK  | OK   | OK   | OK                    |  |
| DATE: 11.06.09  | TEST CONDUCTOR  | QA  |      |   |  |  | CUSTOMER              |  |

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AMS02-PDs

CARLO GAVAZZI SPACE SPA

|   |   |                              |                |                |         |                |         |  |         |  |        |   |       |            |        |  |       |  |        |    |    |     |      |  |    |  |
|---|---|------------------------------|----------------|----------------|---------|----------------|---------|--|---------|--|--------|---|-------|------------|--------|--|-------|--|--------|----|----|-----|------|--|----|--|
| <br><b>AMSO2-PDS</b>   | <b>AMSO2-PDS PFM FULL FUNCTIONAL TEST REPORT</b>      |                              |                |                |         |                |         |  |         |  |        |   |       |            |        |  |       |  |        |    |    |     |      |  |    |  |
| <b>CARLO GAVAZZI SPACE SpA</b>  |   |                              |                |                |         |                |         |  |         |  |        |   |       |            |        |  |       |  |        |    |    |     |      |  |    |  |
| <b>UUT DATA :</b><br>Model      PFM   | <b>Item</b><br><b>AMSO2 POWER DISTRIBUTION SYSTEM</b> | <b>C.I.</b><br><b>PDS 18</b> |                |                |         |                |         |  |         |  |        |   |       |            |        |  |       |  |        |    |    |     |      |  |    |  |
|   |   | <b>EXPECTED VALUE</b>        |                |                |         |                |         |  |         |  |        |   |       |            |        |  |       |  |        |    |    |     |      |  |    |  |
|   |   | <b>MEASURED VALUE</b>        |                |                |         |                |         |  |         |  |        |   |       |            |        |  |       |  |        |    |    |     |      |  |    |  |
|   |   | <b>REMARKS</b>               |                |                |         |                |         |  |         |  |        |   |       |            |        |  |       |  |        |    |    |     |      |  |    |  |
| <b>TEST SEQUENCE</b>  |   |                              |                |                |         |                |         |  |         |  |        |   |       |            |        |  |       |  |        |    |    |     |      |  |    |  |
| <b>TEST PROCEDURE REFERENCE</b>   |   |                              |                |                |         |                |         |  |         |  |        |   |       |            |        |  |       |  |        |    |    |     |      |  |    |  |
| <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 10%;">N° Doc:</td> <td style="width: 20%;">PDS-RP-CGS-072</td> <td style="width: 10%;">N° Doc:</td> <td style="width: 20%;">PDS-RP-CGS-072</td> </tr> <tr> <td>Doc N°:</td> <td></td> <td>Doc N°:</td> <td></td> </tr> <tr> <td>Ediz.:</td> <td>2</td> <td>Data:</td> <td>10/06/2009</td> </tr> <tr> <td>Issue:</td> <td></td> <td>Date:</td> <td></td> </tr> <tr> <td style="border-top: none;">Pagina</td> <td style="border-top: none;">77</td> <td style="border-top: none;">di</td> <td style="border-top: none;">370</td> </tr> <tr> <td style="border-top: none;">Page</td> <td style="border-top: none;"></td> <td style="border-top: none;">of</td> <td style="border-top: none;"></td> </tr> </table> |   |                              | N° Doc:        | PDS-RP-CGS-072 | N° Doc: | PDS-RP-CGS-072 | Doc N°: |  | Doc N°: |  | Ediz.: | 2 | Data: | 10/06/2009 | Issue: |  | Date: |  | Pagina | 77 | di | 370 | Page |  | of |  |
| N° Doc:   | PDS-RP-CGS-072  | N° Doc:                      | PDS-RP-CGS-072 |                |         |                |         |  |         |  |        |   |       |            |        |  |       |  |        |    |    |     |      |  |    |  |
| Doc N°:   |   | Doc N°:                      |                |                |         |                |         |  |         |  |        |   |       |            |        |  |       |  |        |    |    |     |      |  |    |  |
| Ediz.:  | 2   | Data:                        | 10/06/2009     |                |         |                |         |  |         |  |        |   |       |            |        |  |       |  |        |    |    |     |      |  |    |  |
| Issue:  |   | Date:                        |                |                |         |                |         |  |         |  |        |   |       |            |        |  |       |  |        |    |    |     |      |  |    |  |
| Pagina  | 77  | di                           | 370            |                |         |                |         |  |         |  |        |   |       |            |        |  |       |  |        |    |    |     |      |  |    |  |
| Page  |   | of                           |                |                |         |                |         |  |         |  |        |   |       |            |        |  |       |  |        |    |    |     |      |  |    |  |
| <b>TEST REPORT REFERENCE</b>  |   |                              |                |                |         |                |         |  |         |  |        |   |       |            |        |  |       |  |        |    |    |     |      |  |    |  |
| <b>S/N</b><br><b>FM01</b>   |   |                              |                |                |         |                |         |  |         |  |        |   |       |            |        |  |       |  |        |    |    |     |      |  |    |  |

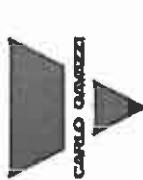
10.3.1.5.6.1 ESEM 3A-2 OUT 1 CURRENT LIMITERS

|                    |   |                 |        |                                    |
|--------------------|---|-----------------|--------|------------------------------------|
| 3A2-A-23           | Disconnect outlet cables  | OK              | OK     |                                    |
| 3A2-A-24           | Connect outlet cables to short circuit simulator without ammeter  | OK              | OK     |                                    |
| 3A2-A-25           | Set short circuit simulator to 3ms  | OK              | OK     |                                    |
| 3A2-A-26           | Set ON in All outlets ON/OFF command and push on the relative "W" command   | OK              | OK     |                                    |
| 3A2-A-27           | Click on Read all in Digital readout column and verify from outlet status located in Digital readout column that all outlets are on                               | OK              | OK     |                                    |
| 3A2-A-28           | Create short circuit pressing start button on short circuit simulator   | OK              | OK     |                                    |
| 3A2-A-29           | Verify the status of the following flags:<br>BOARD STATUS   | OK              | OK     |                                    |
| 3A2-A-30           | Click on Read all in Digital readout column and verify from outlet status located in Digital readout column that all outlets are on                               | OK              | OK     |                                    |
| 3A2-A-31           | Set short circuit simulator to 10ms short circuit duration  | OK              | OK     |                                    |
| 3A2-A-32           | Monitor the short circuit current with a current probe (Ch1 of oscilloscope)<br>Monitor the 28V of a different outlet of Esem3A under test. (Ch2 of oscilloscope) | OK              | OK     |                                    |
| 3A2-A-33           | Create the short circuit pressing start button on short circuit simulator   | OK              | OK     |                                    |
| 3A2-A-34           | Make an hardcopy of the oscilloscope measurements   | OK              | OK     | Add Annex 9 in the end of document |
| 3A2-A-35           | Measure in the previous picture the current limitation value  | 6,50A±10%       | 6,34A  |                                    |
| 3A2-A-36           | Measure in previous picture the current limitation time   | 5ms< T lim <6ms | 5,19ms |                                    |
| 3A2-A-37           | Verify with multimeter the absence of output voltage across load 1  | 0,00V±1,00V     | 0,00V  |                                    |
| 3A2-A-38           | Click on Read All command in Digital Readout column   | OK              | OK     |                                    |
|                    | Verify the status of the following flags:<br>BOARD STATUS<br>OVT Alarm  | NOK             | NOK    |                                    |
| O_1 Status: ER1_N  | OK  | OK              |        |                                    |
| O_2 Status: TPD2   | OFF   | OFF             |        |                                    |
| O_3 Status: TPD6   | ON  | ON              |        |                                    |
| O_4 Status: SPD3_N | ON  | ON              |        |                                    |
| O_5 Status: MPD_N  | ON  | ON              |        |                                    |
| O_6 Status: UPD1   | ON  | ON              |        |                                    |
| O_7 Status: SPD2_N | ON  | ON              |        |                                    |
| O_8 Status: CAB_R  | ON  | ON              |        |                                    |
| 3A2-A-40           | Set the CAN BUS board address to 31   | 31              | 31     |                                    |
| 3A2-A-41           | Select "CAN BUS I/F Side" to B  | B               | B      |                                    |
| 3A2-A-42           | Click on Read All command in Digital Readout column   | OK              | OK     |                                    |

DATE: 1-2 TEST CONDITION: 125

CUSTOMER

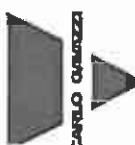
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|---|----------------------|--|------------|
| <br><b>AMS02-PDS</b> |                      | <b>N° Doc:</b> PDS-PR-CGS-006 <b>N° Doc:</b> PDS-RP-CGS-072<br><b>Doc N°:</b><br><b>Ediz.:</b> 2 <b>Data:</b> 10/06/2009 <b>Doc N°:</b> PDS-RP-CGS-072<br><b>Issue:</b><br><b>Page:</b> 78 di 370 <b>Date:</b> Data:<br><b>Page:</b> 78 di 370 <b>Date:</b> Date:<br><b>Page:</b> 78 di 370 <b>Page:</b> 78 di 370 |            |
| <b>AMS02-PDS PFM FULL FUNCTIONAL TEST REPORT</b>  |                      |  |            |
| <b>CARLO GAVAZZI SPACE SpA</b>  |                      |  |            |
| <b>UUT DATA :</b> Model PFM <b>Item</b> AMS02 POWER DISTRIBUTION SYSTEM <b>C.I.</b> PDS 18              |                      | <b>TEST PROCEDURE REFERENCE</b>  |            |
| <b>STEP n°</b>  | <b>TEST SEQUENCE</b> |  | <b>SIN</b> |
|   |                      |  | FM01       |

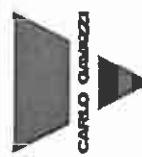
| STEP n°   | TEST SEQUENCE  |  | C.I. | TEST PROCEDURE REFERENCE | SIN | FM01 |
|-----------|--|--|------|--------------------------|-----|------|
|           |  |  |      |                          |     |      |
|           | Verify the status of the following flags:                                  |  |      |                          |     |      |
|           | BOARD STATUS   |  |      |                          |     |      |
|           | OVT Alarm  |  |      |                          |     |      |
|           | O_1 Status: ER1_N  |  |      |                          |     |      |
|           | O_2 Status: TPD2   |  |      |                          |     |      |
| 3A-2-A.43 | O_3 Status: TPD6   |  |      |                          |     |      |
|           | O_4 Status: SPD3_N   |  |      |                          |     |      |
|           | O_5 Status: MPD_N  |  |      |                          |     |      |
|           | O_6 Status: UPD1   |  |      |                          |     |      |
|           | O_7 Status: SPD2_N   |  |      |                          |     |      |
|           | O_8 Status: CAB_R  |  |      |                          |     |      |
| 3A-2-A.44 | Set OFF in the window All Outlets ON/OFF and push the relative "W" command |  |      |                          |     |      |
| 3A-2-A.45 | Disconnect the short circuit simulator from outlet cables                  |  |      |                          |     |      |
| 3A-2-A.46 | Disconnect current probe   |  |      |                          |     |      |
| 3A-2-A.47 | Connect outlet cables to active load                                       |  |      |                          |     |      |
| 3A-2-A.48 | Set ON in All outlets ON/OFF command and push on the relative "W" command  |  |      |                          |     |      |
|           | Verify the status of the following flags:                                  |  |      |                          |     |      |
|           | BOARD STATUS   |  |      |                          |     |      |
|           | OVT Alarm  |  |      |                          |     |      |
|           | From O_1 Status: ER1_N to O_8 Status: CAB_R                                |  |      |                          |     |      |
| 3A-2-A.49 | Set the CAN BUS board address to 30  |  |      |                          |     |      |
| 3A-2-A.50 | Set the CAN BUS board address to 30  |  |      |                          |     |      |
| 3A-2-A.51 | Select "CAN BUS I/F Side" to A   |  |      |                          | A   | A    |
| 3A-2-A.52 | Set OFF in the window All Outlets ON/OFF and push the relative "W" command |  |      |                          | OK  | OK   |
| 3A-2-A.53 | Click on Read All command in Digital Readout column                        |  |      |                          | OK  | OK   |
|           | Verify the status of the following flags:                                  |  |      |                          |     |      |
|           | BOARD STATUS   |  |      |                          |     |      |
|           | OVT Alarm  |  |      |                          |     |      |
|           | From O_1 Status: ER1_N to O_8 Status: CAB_R                                |  |      |                          |     |      |
| 3A-2-A.54 | Set ON in All outlets ON/OFF command and push on the relative "W" command  |  |      |                          | OK  | OK   |
| 3A-2-A.55 | Click on Read All command in Digital Readout column                        |  |      |                          | OK  | OK   |
| 3A-2-A.56 | Verify the status of the following flags:                                  |  |      |                          | OK  | OK   |
|           | BOARD STATUS   |  |      |                          |     |      |
|           | OVT Alarm  |  |      |                          |     |      |
|           | From O_1 Status: ER1_N to O_8 Status: CAB_R                                |  |      |                          |     |      |
| 3A-2-A.57 | Set OFF in the window All Outlets ON/OFF and push the relative "W" command |  |      |                          | OK  | OK   |
| 3A-2-A.58 | Set OFF in the window All Outlets ON/OFF and push the relative "W" command |  |      |                          | OK  | OK   |

|                |                              |    |                    |                             |
|----------------|------------------------------|----|--------------------|-----------------------------|
| DATE: 11.06.09 | TEST CONDUCTOR <i>JF2010</i> | QA | <i>[Signature]</i> | CUSTOMER <i>[Signature]</i> |
|----------------|------------------------------|----|--------------------|-----------------------------|

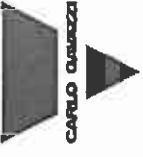
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|  <p><b>AMSO2-PDS</b></p> <p>CARLO GAVAZZI SPACE SpA</p> |   | <p>N° Doc: PDS-PR-CGS-006<br/>Doc N°: PDS-RP-CGS-072</p> <p>Ediz.: 2 Date: 10/06/2009<br/>Issue: 1 Date: 27/06/2009</p> <p>Pagina 79 di 370<br/>Page 79 di 370</p> |   |
|--|---|--|---|
| AMS02-PDS PFM FULL FUNCTIONAL TEST REPORT  |   | TEST PROCEDURE REFERENCE   |   |
| UUT DATA :   | Model   | Item   | S/N   |
| STEP n°  | TEST SEQUENCE   | C.I.   | FM01  |
| 3A-2-A.59  | Click on Read All command in Digital Readout column<br>Verify the status of the following flags:<br>BOARD STATUS  | OK   | OK  |
| 3A-2-A.60  | OVT Alarm<br>From O_1 CMD: ER1_N to O_8 CMD: CAB_R<br>From O_1 Status: ER1_N to O_8 Status: CAB_R   | OK<br>OK<br>OFF<br>OFF   | OK<br>OK<br>OFF<br>OFF  |
| 3A-2-A.61  | Disconnect outlet cables  | OK   | OK  |
| 3A-2-A.62  | Connect outlet cables to short circuit simulator without amperometer  | OK   | OK  |
| 3A-2-A.63  | Set short circuit simulator to 3ms  | OK   | OK  |
| 3A-2-A.64  | Set ON in All outlets ON/OFF command and push on the relative "V" command<br>Click on Read all in Digital readout column and verify from outlet status located in Digital readout column<br>that all outlets are on | OK   | OK  |
| 3A-2-A.65  | Create short circuit pressing start button on short circuit simulator   | OK   | OK  |
| 3A-2-A.66  | Verify the status of the following flags:<br>BOARD STATUS   | OK   | OK  |
| 3A-2-A.67  | Click on Read all in Digital readout column and verify from outlet status located in Digital readout column<br>that all outlets are on  | OK   | OK  |
| 3A-2-A.68  | Set short circuit simulator to 10ms short circuit duration  | OK   | OK  |
| 3A-2-A.69  | Monitor the short circuit current with a current probe (Ch1 of oscilloscope)  | OK   | OK  |
| 3A-2-A.70  | Monitor the 28V of a different outlet of Esem3A under test (Ch2 of oscilloscope)  | OK   | OK  |
| 3A-2-A.71  | Create the short circuit pressing start button on short circuit simulator   | OK   | OK  |
| 3A-2-A.72  | Make an hardcopy of the oscilloscope measurements   | OK   | OK  |
| 3A-2-A.73  | Measure in the previous picture the current limitation value  | $6.50A \pm 10\%$   | 6.48A   |
| 3A-2-A.74  | Measure in previous picture the current limitation time   | $5ms < T_{lim} < 6ms$  | 5.16ms  |
| 3A-2-A.75  | Verify with multimeter the absence of output voltage across load 2  | 0.00V  | 0.00V   |
| 3A-2-A.76  | Click on Read All command in Digital Readout column<br>Verify the status of the following flags:<br>BOARD STATUS  | OK   | OK  |
| 3A-2-A.77  | OVT Alarm<br>O_1 Status: ER1_N<br>O_2 Status: TPD2<br>O_3 Status: TPD6<br>O_4 Status: SPD3_N<br>O_5 Status: MPD_N<br>O_6 Status: UPD1   | NOK<br>OK<br>ON<br>OFF<br>ON<br>ON<br>ON<br>ON<br>ON<br>ON<br>ON<br>ON   | NOK<br>OK<br>ON<br>OFF<br>ON<br>ON<br>ON<br>ON<br>ON<br>ON<br>ON<br>ON                      |
| DATE: 11.06.09   | TEST CONDUCTOR   | QA    | CUSTOMER  |

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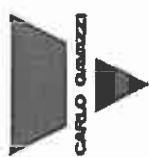
|  <p><b>CARLO GAVAZZI</b></p> <p><b>CARLO GAVAZZI SPACE SpA</b></p> |   | <h1 style="text-align: center;"><b>AMSO2-PDS</b></h1> <p style="text-align: center;">AMS02-PDS PFM FULL FUNCTIONAL TEST REPORT</p> |      | N° Doc:<br>Doc N°:<br>Ediz.:<br>Issue: | PDS-PR-CGS-006<br>Data:<br>Date:<br>2<br>10/06/2009 | N° Doc:<br>Doc N°:<br>Ediz.:<br>Issue:        | PDS-RP-CGS-072<br>Data:<br>Date:<br>1<br>27/06/2009              |
|---|---|--|------|--|---|---|--|
| UUT DATA :  | Model   | PFM  | Item | AMSO2 POWER DISTRIBUTION SYSTEM        | C.I.  | TEST PROCEDURE REFERENCE                      | TEST REPORT REFERENCE  |
| STEP n°   | TEST SEQUENCE   |  |      |  |   | S/N   | FM01   |
| STEP n°   | TEST SEQUENCE   |  |      |  |   | EXPECTED VALUE                                | MEASURED VALUE   |
| STEP n°   | TEST SEQUENCE   |  |      |  |   | REMARKS                                       |  |
| 3A-2-A.78   | O_7 Status: SPD2_N<br>O_8 Status: CAB_R   | Set the CAN BUS board address to 31  |      |  | ON<br>ON  | ON<br>ON                                      |  |
| 3A-2-A.79   | Select "CAN BUS If Side" to B   |  |      |  | 31  | 31  |  |
| 3A-2-A.80   | Click on Read All command in Digital Readout column   |  |      |  | B<br>OK   | B<br>OK                                       |  |
| Verify the status of the following flags:   |   |  |      |  |   |   |  |
| BOARD STATUS  |   |  |      |  |   |   |  |
| OVT Alarm   |   |  |      |  |   |   |  |
| 3A-2-A.81   | O_1 Status: ER1_N<br>O_2 Status: TPD2<br>O_3 Status: TPD6<br>O_4 Status: SPD3_N<br>O_5 Status: MPD_N<br>O_6 Status: UPD1<br>O_7 Status: SPD2_N<br>O_8 Status: CAB_R | Set OFF in the window All Outlets ON/OFF and push the relative "W" command   |      |  | NOK<br>OK<br>ON<br>OFF<br>ON<br>ON<br>ON<br>ON      | OK<br>OK<br>ON<br>OFF<br>ON<br>ON<br>ON<br>ON | NOK<br>OK<br>ON<br>OFF<br>ON<br>ON<br>ON<br>ON                   |
| 3A-2-A.82   |   | Disconnect the short circuit simulator from outlet cables  |      |  | ON<br>OK  | ON<br>OK                                      | Protection reset   |
| 3A-2-A.83   |   | Disconnect current probe   |      |  | OK<br>OK  | OK<br>OK                                      |  |
| 3A-2-A.84   |   | Connect outlet cables to active load   |      |  | OK<br>OK  | OK<br>OK                                      |  |
| 3A-2-A.85   |   | Set ON in All outlets ON/OFF command and push on the relative "W" command  |      |  | OK<br>OK  | OK<br>OK                                      |  |
| 3A-2-A.86   |   | Verify the status of the following flags:  |      |  | OK<br>OK<br>ON                                      | OK<br>OK<br>ON                                | In order to verify that CAN BUS 30 is able to reset a protection |
| BOARD STATUS  |   |  |      |  |   |   |  |
| 3A-2-A.87   | OVT Alarm   | From O_1 Status: ER1_N to O_8 Status: CAB_R  |      |  | OK<br>OK<br>ON                                      | OK<br>OK<br>ON                                |  |
| 3A-2-A.88   | Set the CAN BUS board address to 30   |  |      |  | 30  | 30  |  |
| 3A-2-A.89   | Select "CAN BUS If Side" to A   |  |      |  | A   | A   |  |
| 3A-2-A.90   | Set OFF in the window All Outlets ON/OFF and push the relative "W" command  |  |      |  | OK<br>OK  | OK<br>OK                                      |  |
| 3A-2-A.91   | Click on Read All command in Digital Readout column   |  |      |  | OK<br>OK  | OK<br>OK                                      |  |
| Verify the status of the following flags:   |   |  |      |  |   |   |  |
| 3A-2-A.92   | BOARD STATUS  |  |      |  | OK<br>OK<br>OFF                                     | OK<br>OK<br>OFF                               |  |
| OVT Alarm   |   |  |      |  |   |   |  |
| 3A-2-A.93   | From O_1 Status: ER1_N to O_8 Status: CAB_R   |  |      |  | OK<br>OK  | OK<br>OK                                      |  |
| 3A-2-A.94   | Set ON in All outlets ON/OFF command and push on the relative "W" command   |  |      |  | OK<br>OK  | OK<br>OK                                      |  |
| 3A-2-A.95   | Click on Read All command in Digital Readout column   |  |      |  | OK<br>OK  | OK<br>OK                                      |  |
| Verify the status of the following flags:   |   |  |      |  |   |   |  |
| DATE: 11.06.09  | TEST CONDUCTOR  | QA   |      |  |   |   | CUSTOMER   |

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|  <p><b>AMS02-PDS</b></p> <p>CARLO GAVAZZI SPACE SpA</p>   |  | <p>N° Doc: PDS-PR-CGS-006<br/>Doc N°: 2<br/>Ediz.: 2<br/>Issue: 10/06/2009<br/>Data: Date:<br/>Pagina 81 di 370<br/>Page: 81 di 370</p> <p>N° Doc: PDS-RP-CGS-072<br/>Doc N°: 1<br/>Ediz.: 1<br/>Issue: Data:<br/>Pagina 81 di 370<br/>Page: 81 di 370</p> |   |
|--|--|--|---|
| <p>AMS02-PDS PFM FULL FUNCTIONAL TEST REPORT</p>   |  | <p>TEST PROCEDURE REFERENCE</p>  |   |
| <p>TEST REPORT REFERENCE</p>   |  |  |   |
| UUT DATA :   | Model  | PFM  | Item  |
| STEP n°  | TEST SEQUENCE  | AMS02 POWER DISTRIBUTION SYSTEM  | C.I.  |
| BOARD STATUS   | OVT Alarm<br>From Q_1 Status: ER1_N to Q_8 Status: CAB_R<br>3A-2-A.96 Set OFF in the window All Outlets ON/OFF and push the relative "W" command | PDS 18   | S/N FM01  |
| TEST PROCEDURE REFERENCE   |  | EXPECTED VALUE   | MEASURED VALUE  |
| REMARKS  |  |  |   |
| <p>BOARD STATUS</p> <p>OVT Alarm<br/>From Q_1 Status: ER1_N to Q_8 Status: CAB_R<br/>3A-2-A.96 Set OFF in the window All Outlets ON/OFF and push the relative "W" command</p>  |  | OK   | OK  |
| <p>TEST PROCEDURE REFERENCE</p>  |  | OK   | OK  |
| <p>3A-2-A.97 Click on Read All command in Digital Readout column</p> <p>Verify the status of the following flags:</p> <p>BOARD STATUS</p> <p>OVT Alarm</p> <p>From Q_1 CMD: ER1_N to Q_8 CMD: CAB_R</p> <p>From Q_1 Status: ER1_N to Q_8 Status: CAB_R</p> <p>3A-2-A.98 Disconnect outlet cables</p> |  | OK   | OK  |
| <p>3A-2-A.99 Connect outlet cables to short circuit simulator without amperometer</p>  |  | OK   | OK  |
| <p>3A-2-A.100 Set short circuit simulator to 3ms</p>   |  | OK   | OK  |
| <p>3A-2-A.101 Set ON in All outlets ON/OFF command and push on the relative "W" command</p>  |  | OK   | OK  |
| <p>3A-2-A.102 Click on Read all in Digital readout column and verify from outlet status located in Digital readout column that all outlets are on</p>  |  | OK   | OK  |
| <p>3A-2-A.103 Create short circuit pressing start button on short circuit simulator</p>  |  | OK   | OK  |
| <p>3A-2-A.104 Verify the status of the following flags:</p>  |  | OK   | OK  |
| <p>3A-2-A.105 BOARD STATUS</p>   |  | OK   | OK  |
| <p>3A-2-A.106 Click on Read all in Digital readout column and verify from outlet status located in Digital readout column that all outlets are on</p>  |  | OK   | OK  |
| <p>3A-2-A.107 Set short circuit simulator to 10ms short circuit duration</p>   |  | OK   | OK  |
| <p>3A-2-A.108 Monitor the short circuit current with a current probe (Ch1 of oscilloscope)</p>   |  | OK   | OK  |
| <p>3A-2-A.109 Monitor the 28V of a different outlet of Esem3A under test (Ch2 of oscilloscope)</p>   |  | OK   | OK  |
| <p>3A-2-A.110 Create the short circuit pressing start button on short circuit simulator</p>  |  | OK   | OK  |
| <p>3A-2-A.111 Make an hardcopy of the oscilloscope measurements</p>  |  | OK   | OK  |
| <p>3A-2-A.112 Measure in previous picture the current limitation value</p>   |  | $6,50A \pm 10\%$   | 6,48A   |
| <p>3A-2-A.113 Measure in previous picture the current limitation time</p>  |  | $5ms < T_{lim} < 6ms$  | 5,12ms  |
| <p>3A-2-A.114 Verify with multimeter the absence of output voltage across load 3</p>   |  | $0,00V \pm 1,00V$  | 0,00V   |
| <p>3A-2-A.115 Verify the status of the following flags:</p>  |  | OK   | OK  |
| <p>BOARD STATUS</p> <p>OVT Alarm</p>   |  | NOK<br>OK  | NOK<br>OK   |
| DATE: 11.06.09   | TEST CONDUCTOR    | QA   |  |
|  |  | CUSTOMER   |   |

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|  <p><b>AMS02-PDS</b></p> <p>CARLO GAVAZZI SPACE SpA</p>   |  | <p>N° Doc:<br/>Doc N°: <b>PDS-PR-CGS-006</b></p> <p>Ediz.: <b>2</b></p> <p>Data:<br/>Date: <b>10/06/2009</b></p> <p>Issue:<br/>Date:<br/>Pagina<br/>Page <b>82</b> di <b>370</b></p> <p>N° Doc:<br/>Doc N°: <b>PDS-RP-CGS-072</b></p> <p>Ediz.: <b>1</b></p> <p>Data:<br/>Date:<br/>Pagina<br/>Page <b>82</b> di <b>370</b></p> |   |
|--|--|---|---|
| <p>AMS02-PDS PFM FULL FUNCTIONAL TEST REPORT</p>   |  | <p>TEST PROCEDURE REFERENCE</p>   |   |
| <p>TEST REPORT REFERENCE</p>   |  | <p>FM01</p>   |   |
| UUT DATA :   | Model  | PFM   | Item  |
| STEP n°  | TEST SEQUENCE  |   |   |
| STEP n°  | TEST SEQUENCE  | ITEM  | AM502 POWER DISTRIBUTION SYSTEM   |
| STEP n°  | TEST SEQUENCE  | C.I.  | PDS 18  |
| STEP n°  | TEST SEQUENCE  |   |   |
| O_1 Status: ER1_N  |  |   |   |
| O_2 Status: TPD2   |  |   |   |
| O_3 Status: TPD6   |  |   |   |
| O_4 Status: SPD3_N   |  |   |   |
| O_5 Status: MPD_N  |  |   |   |
| O_6 Status: UPD1   |  |   |   |
| O_7 Status: SPD2_N   |  |   |   |
| O_8 Status: CAB_R  |  |   |   |
| 3A-2-A.116   | Set the CAN BUS board address to 31  |   |   |
| 3A-2-A.117   | Select "CAN BUS I/F Side" to B   |   |   |
| 3A-2-A.118   | Click on Read All command in Digital Readout column                        |   |   |
|  | Verify the status of the following flags:                                  |   |   |
|  | BOARD STATUS   |   |   |
|  | OVT Alarm  |   |   |
| O_1 Status: ER1_N  |  |   |   |
| O_2 Status: TPD2   |  |   |   |
| O_3 Status: TPD6   |  |   |   |
| O_4 Status: SPD3_N   |  |   |   |
| O_5 Status: MPD_N  |  |   |   |
| O_6 Status: UPD1   |  |   |   |
| O_7 Status: SPD2_N   |  |   |   |
| O_8 Status: CAB_R  |  |   |   |
| 3A-2-A.119   | Set OFF in the window All Outlets ON/OFF and push the relative "W" command |   |   |
| 3A-2-A.120   | Set OFF in the window All Outlets ON/OFF and push the relative "W" command |   |   |
| 3A-2-A.121   | Disconnect the short circuit simulator from outlet cables                  |   |   |
| 3A-2-A.122   | Disconnect current probe   |   |   |
| 3A-2-A.123   | Connect outlet cables to active load                                       |   |   |
| 3A-2-A.124   | Set ON in All outlets ON/OFF command and push on the relative "W" command  |   |   |
|  | Verify the status of the following flags:                                  |   |   |
|  | BOARD STATUS   |   |   |
|  | OVT Alarm  |   |   |
| From O_1 Status: ER1_N to O_8 Status: CAB_R  |  |   |   |
| 3A-2-A.125   | Set the CAN BUS board address to 30  |   |   |
| 3A-2-A.126   | Set the CAN BUS board address to 30  |   |   |
| 3A-2-A.127   | Select "CAN BUS I/F Side" to A   |   |   |
| 3A-2-A.128   | Set OFF in the window All Outlets ON/OFF and push the relative "W" command |   |   |
| 3A-2-A.129   | Click on Read All command in Digital Readout column                        |   |   |
| 3A-2-A.130   | Verify the status of the following flags:                                  |   |   |
|  | DATE: 11.06.09   | TEST CONDUCTOR  | QA  |
|  |  |   |  |
|  |  |   | CUSTOMER  |
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AMS02-PDS

AMS02-PDS PFM FULL FUNCTIONAL TEST REPORT  
CABIN GAVAZZI SPACE S.p.A.

AMS02-PDS PFM FULL FUNCTIONAL TEST REPORT

| UUT DATA : |   | TEST SEQUENCE |      | TEST PROBABILITY RELATIONAL     |                 | TEST REPORT REFERENCE |                 |      |
|------------|---|---------------|------|---------------------------------|-----------------|-----------------------|-----------------|------|
| STEP n*    | Model   | PFM           | Item | AMS02 POWER DISTRIBUTION SYSTEM | C.I.            | PDS 18                | S/N             | FM01 |
| 3A-2-A.131 | BOARD STATUS<br>OVT Alarm<br>From O_1 Status: ER1_N to O_8 Status: CAB_R<br>Set ON in All outlets ON/OFF command and push on the relative "W" command   |               |      |                                 | OK<br>OK<br>OFF | OK<br>OK<br>OFF       | OK<br>OK<br>OFF |      |
| 3A-2-A.132 | Click on Read All command in Digital Readout column   |               |      |                                 | OK              | OK                    | OK              |      |
|            | Verify the status of the following flags:<br><br>3A-2-A.133<br>BOARD STATUS<br>OVT Alarm<br>From O_1 Status: ER1_N to O_8 Status: CAB_R<br>Set OFF in the window All Outlets ON/OFF and push the relative "W" command |               |      |                                 | OK<br>OK<br>ON  | OK<br>OK<br>ON        | OK<br>OK<br>ON  |      |
| 3A-2-A.134 |   |               |      |                                 | OK              | OK                    | OK              |      |

10.3.1.5.6.4 ESEM 3A-2 OUT 4 CURRENT LIMITERS

|            |   |  |          |                                     |
|------------|---|--|----------|-------------------------------------|
|            |   |  |          |                                     |
| 3A-2-A-135 | Click on Read All command in Digital Readout column   |  | OK       | OK                                  |
|            | Verify the status of the following flags:   |  | OK       | OK                                  |
|            | BOARD STATUS  |  | OK       | OK                                  |
| 3A-2-A-136 | OVT Alarm   |  | OK       | OK                                  |
|            | From O_1 CMD: ER1_N to O_8 CMD: CAB_R   |  | OFF      | OFF                                 |
|            | From O_1 Status: ER1_N to O_8 Status: CAB_R   |  | OFF      | OFF                                 |
| 3A-2-A-137 | Disconnect outlet cables  |  | OK       | OK                                  |
| 3A-2-A-138 | Connect outlet cables to short circuit simulator without ammeter  |  | OK       | OK                                  |
| 3A-2-A-139 | Set short circuit simulator to 3ms  |  | OK       | OK                                  |
| 3A-2-A-140 | Set ON in All outlets ON/OFF command and push on the relative "W" command   |  | OK       | OK                                  |
| 3A-2-A-141 | Click on Read all in Digital readout column and verify from outlet status located in Digital readout column that all outlets are on |  | OK       | OK                                  |
| 3A-2-A-142 | Create short circuit pressing start button on short circuit simulator   |  | OK       | OK                                  |
| 3A-2-A-143 | Verify the status of the following flags:   |  | OK       | OK                                  |
|            | BOARD STATUS  |  | OK       | OK                                  |
| 3A-2-A-144 | Click on Read all in Digital readout column and verify from outlet status located in Digital readout column that all outlets are on |  | OK       | OK                                  |
| 3A-2-A-145 | Set short circuit simulator to 10ms short circuit duration  |  | OK       | OK                                  |
| 3A-2-A-146 | Monitor the short circuit current with a current probe (Ch1 of oscilloscope)  |  | OK       | OK                                  |
| 3A-2-A-147 | Monitor the 28V of a different outlet of Esem3A under test (Ch2 of oscilloscope)  |  | OK       | OK                                  |
| 3A-2-A-148 | Create the short circuit pressing start button on short circuit simulator   |  | OK       | OK                                  |
| 3A-2-A-149 | Make an hardcopy of the oscilloscope measurements   |  | OK       | OK                                  |
|            | Measure in the previous picture the current limitation value  |  | 6,50±10% | 6,29A                               |
|            |   |  |          | Add Annex 12 in the end of document |

DATE: 11.06.09 TEST CONDUCTOR *[Signature]*

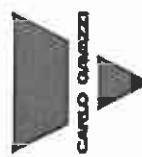
ESTATE

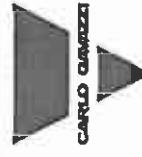
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| AMS02-PDS                                 |  | PDS-PR-CGS-006   |                                 | PDS-RP-CGS-072   |                |
|---|--|------------------|---------------------------------|------------------|----------------|
| AMS02-PDS PFM FULL FUNCTIONAL TEST REPORT |  | Data: 10/06/2009 |                                 | Data: 27/06/2009 |                |
| UUT DATA :                                | Model  | Item             | AM502 POWER DISTRIBUTION SYSTEM | C.I.             | PDS 18         |
| STEP n°                                   | TEST SEQUENCE  |                  |                                 | EXPECTED VALUE   | MEASURED VALUE |
|   |  |                  |                                 |                  | REMARKS        |
| 3A-2-A.150                                | Measure in previous picture the current limitation time            |                  |                                 | 5ms< T lim<6ms   | 5,26ms         |
| 3A-2-A.151                                | Verify with multimeter the absence of output voltage across load 4 |                  |                                 | 0,00V±1,00V      | 0,00V          |
| 3A-2-A.152                                | Click on Read All command in Digital Readout column                |                  |                                 | OK               | OK             |
| Verify the status of the following flags: |  |                  |                                 |                  |                |
| BOARD STATUS                              |  |                  |                                 |                  |                |
| OVT Alarm                                 |  |                  |                                 |                  |                |
| O_1 Status: ER1_N                         |  |                  |                                 |                  |                |
| O_2 Status: TPD2                          |  |                  |                                 |                  |                |
| O_3 Status: TPD6                          |  |                  |                                 |                  |                |
| O_4 Status: SPD3_N                        |  |                  |                                 |                  |                |
| O_5 Status: MPD_N                         |  |                  |                                 |                  |                |
| O_6 Status: UPD1                          |  |                  |                                 |                  |                |
| O_7 Status: SPD2_N                        |  |                  |                                 |                  |                |
| O_8 Status: CAB_R                         |  |                  |                                 |                  |                |
| 3A-2-A.154                                | Set the CAN BUS board address to 31                                |                  |                                 | ON               | ON             |
| 3A-2-A.155                                | Select "CAN BUS I/F Side" to B                                     |                  |                                 | B                | B              |
| 3A-2-A.156                                | Click on Read All command in Digital Readout column                |                  |                                 | OK               | OK             |
| Verify the status of the following flags: |  |                  |                                 |                  |                |
| BOARD STATUS                              |  |                  |                                 |                  |                |
| OVT Alarm                                 |  |                  |                                 |                  |                |
| O_1 Status: ER1_N                         |  |                  |                                 |                  |                |
| O_2 Status: TPD2                          |  |                  |                                 |                  |                |
| O_3 Status: TPD6                          |  |                  |                                 |                  |                |
| O_4 Status: SPD3_N                        |  |                  |                                 |                  |                |
| O_5 Status: MPD_N                         |  |                  |                                 |                  |                |
| O_6 Status: UPD1                          |  |                  |                                 |                  |                |
| O_7 Status: SPD2_N                        |  |                  |                                 |                  |                |
| O_8 Status: CAB_R                         |  |                  |                                 |                  |                |
| 3A-2-A.158                                | Set the CAN BUS board address to 30                                |                  |                                 | ON               | ON             |
| 3A-2-A.159                                | Select "CAN BUS I/F Side" to A                                     |                  |                                 | A                | A              |
| 3A-2-A.160                                | Click on Read All command in Digital Readout column                |                  |                                 | OK               | OK             |
| Verify the status of the following flags: |  |                  |                                 |                  |                |
| BOARD STATUS                              |  |                  |                                 |                  |                |
| OVT Alarm                                 |  |                  |                                 |                  |                |
| O_1 Status: ER1_N                         |  |                  |                                 |                  |                |
| O_2 Status: TPD2                          |  |                  |                                 |                  |                |
| O_3 Status: TPD6                          |  |                  |                                 |                  |                |
| O_4 Status: SPD3_N                        |  |                  |                                 |                  |                |
| DATE: 11.06.09                            | TEST CONDUCTOR   | QA               | QA                              | QA               | QA             |
| CUSTOMER                                  |  |                  |                                 |                  |                |

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|  <p><b>CARLO GAVAZZI</b></p>  |  | <h1 style="text-align: center;">AMS02-PDS</h1> <p style="text-align: center;">AMS02-PDS PFM FULL FUNCTIONAL TEST REPORT</p> |      | <p>N° Doc: <b>PDS-RP-CGS-006</b></p> <p>Doc N°: <b>PDS-RP-CGS-072</b></p> <p>Ediz.: <b>2</b></p> <p>Date: <b>10/06/2009</b></p> <p>Issue: <b>1</b></p> <p>Data: <b>27/06/2009</b></p> <p>Pagina: <b>85</b></p> <p>di <b>370</b></p> <p>Pagina: <b>85</b></p> <p>di <b>370</b></p> |                                    |
|--|--|---|------|---|------------------------------------|
| TEST PROCEDURE REFERENCE   |  |   |      |   | TEST REPORT REFERENCE              |
| UUT DATA:  | Model  | PFM   | Item | AMS02 POWER DISTRIBUTION SYSTEM   | C.I. PDS 18                        |
| STEP n°  | TEST SEQUENCE  |   |      |   | S/N FM01                           |
| STEP n°  | TEST SEQUENCE  |   |      |   | S/N FM01                           |
| STEP n°  | TEST SEQUENCE  |   |      |   | EXPECTED VALUE                     |
| STEP n°  | TEST SEQUENCE  |   |      |   | MEASURED VALUE                     |
| STEP n°  | TEST SEQUENCE  |   |      |   | REMARKS                            |
|  | O_5 Status: MPD_N<br>O_6 Status: UPD1<br>O_7 Status: SPD2_N<br>O_8 Status: CAB_R                             |   |      |   | ON<br>ON<br>ON<br>ON               |
| 3A-2-A.162   | Set OFF in the window All Outlets ON/OFF and push the relative "W" command                                   |   |      |   | ON<br>ON<br>ON<br>ON               |
| 3A-2-A.163   | Disconnect the short circuit simulator from outlet cables  |   |      |   | OK<br>OK<br>OK<br>OK               |
| 3A-2-A.164   | Disconnect current probe   |   |      |   | OK<br>OK<br>OK<br>OK               |
| 3A-2-A.165   | Connect outlet cables to active load   |   |      |   | OK<br>OK<br>OK<br>OK               |
| 3A-2-A.166   | Set ON in All outlets ON/OFF command and push on the relative "W" command                                    |   |      |   | OK<br>OK<br>OK<br>OK               |
| 3A-2-A.167   | Verify the status of the following flags:<br><br>BOARD STATUS<br>From O_1 Status: ER1_N to O_8 Status: CAB_R |   |      |   | OK<br>OK<br>OK<br>OK               |
| 3A-2-A.168   | Set the CAN BUS board address to 30  |   |      |   | 30<br>30                           |
| 3A-2-A.169   | Select "CAN BUS I/F Side" to A   |   |      |   | A<br>A                             |
| 3A-2-A.170   | Set OFF in the window All Outlets ON/OFF and push the relative "W" command                                   |   |      |   | OK<br>OK<br>OK                     |
| 3A-2-A.171   | Click on Read All command in Digital Readout column  |   |      |   | OK<br>OK<br>OK                     |
| 3A-2-A.172   | Verify the status of the following flags:<br><br>BOARD STATUS<br>From O_1 Status: ER1_N to O_8 Status: CAB_R |   |      |   | OK<br>OK<br>OK<br>OK<br>OFF<br>OFF |
| 3A-2-A.173   | Set ON in All outlets ON/OFF command and push on the relative "W" command                                    |   |      |   | OK<br>OK<br>OK                     |
| 3A-2-A.174   | Click on Read All command in Digital Readout column  |   |      |   | OK<br>OK<br>OK                     |
| 3A-2-A.175   | Verify the status of the following flags:<br><br>BOARD STATUS<br>From O_1 Status: ER1_N to O_8 Status: CAB_R |   |      |   | OK<br>OK<br>OK<br>OK               |
| 3A-2-A.176   | Set OFF in the window All Outlets ON/OFF and push the relative "W" command                                   |   |      |   | OK<br>OK<br>OK<br>OK               |
| In order to Verify that CAN BUS 30 is able to reset a protection   |  |   |      |   |                                    |
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| DATE: 11.06.09   | TEST CONDUCTOR   | QA  |      |   | CUSTOMER                           |

|  <b>AMS02-PDS</b><br><b>CARLO GAVAZZI SPACE SpA</b> |                          | <b>N° Doc:</b> PDS-PR-CGS-006<br><b>Doc N°:</b> 2<br><b>Ediz.:</b> Data: 10/06/2009<br><b>Issue:</b> 1<br><b>Date:</b> Date:<br><b>Pagina:</b> 86 di 370<br><b>Page:</b> Pagina 86 di 370 |  |
|--|--------------------------|---|--|
| <b>AMS02-PDS PFM FULL FUNCTIONAL TEST REPORT</b>   |                          |   |  |
| <b>UUT DATA :</b>  | <b>Model</b>             | <b>Item</b>   | <b>AMSO2 POWER DISTRIBUTION SYSTEM</b> |
| <b>STEP n°</b>   | <b>TEST SEQUENCE</b>     | <b>C.I.</b>   | <b>PDS 18</b>                          |
| S/N  | TEST PROCEDURE REFERENCE | C.I.  | TEST REPORT REFERENCE                  |
| S/N  | FM01                     | FM01  | FM01                                   |

### 10.3.15.6.5 ESEM 3A-2 OUT 5 CURRENT LIMITERS

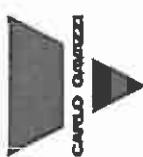
| 3A-2-A.177 | Click on Read All command in Digital Readout column<br>Verify the status of the following flags:<br><b>BOARD STATUS</b>                | OK  | OK   |
|------------|--|---|--|
| 3A-2-A.178 | OVT Alarm<br>From O_1 CMD: ER1_N to O_8 CMD: CAB_R<br>From O_1 Status: ER1_N to O_8 Status: CAB_R                                      | OK<br>OK<br>OFF   | OK<br>OK<br>OFF  |
| 3A-2-A.179 | Disconnect outlet cables   | OK  | OK   |
| 3A-2-A.180 | Connect outlet cables to short circuit simulator without amperometer   | OK  | OK   |
| 3A-2-A.181 | Set short circuit simulator to 3mms  | OK  | OK   |
| 3A-2-A.182 | Set ON in All outlets ON/OFF command and push on the relative "W" command  | OK  | OK   |
| 3A-2-A.183 | Click on Read all in Digital readout column and verify from outlet status located in Digital readout column<br>that all outlets are on | OK  | OK   |
| 3A-2-A.184 | Create short circuit pressing start button on short circuit simulator  | OK  | OK   |
| 3A-2-A.185 | Verify the status of the following flags:<br><b>BOARD STATUS</b>   | OK  | OK   |
| 3A-2-A.186 | Click on Read all in Digital readout column and verify from outlet status located in Digital readout column<br>that all outlets are on | OK  | OK   |
| 3A-2-A.187 | Set short circuit simulator to 10ms short circuit duration   | OK  | OK   |
| 3A-2-A.188 | Monitor the short circuit current with a current probe (Ch1 of oscilloscope)   | OK  | OK   |
| 3A-2-A.189 | Monitor the 28V of a different outlet of Esem3A under test (Ch2 of oscilloscope)   | OK  | OK   |
| 3A-2-A.190 | Create the short circuit pressing start button on short circuit simulator  | OK  | OK   |
| 3A-2-A.191 | Make an hardcopy of the oscilloscope measurements  | OK  | OK   |
| 3A-2-A.192 | Measure in the previous picture the current limitation value   | 6,50±10%  | 6,38A  |
| 3A-2-A.193 | Measure in previous picture the current limitation time  | 5ms<T_lim<6ms   | 5,19ms   |
| 3A-2-A.194 | Verify with multimeter the absence of output voltage across load 5   | 0,00V±1,00V   | 0,00V  |
|            | Click on Read All command in Digital Readout column<br>Verify the status of the following flags:<br><b>BOARD STATUS</b>                | OK  | OK   |
| 3A-2-A.195 | OVT Alarm<br>O_1 Status: ER1_N<br>O_2 Status: TPD2<br>O_3 Status: TPD6<br>O_4 Status: SPD3_N<br>O_5 Status: MPD_N<br>O_6 Status: UPD1  | NOK<br>OK<br>ON<br>ON<br>ON<br>ON<br>ON<br>ON<br>ON<br>ON<br>ON<br>ON<br>ON | OK<br>OK<br>ON<br>ON<br>ON<br>ON<br>ON<br>ON<br>ON<br>ON<br>ON<br>ON<br>ON |

DATE: 11.06.09 TEST CONDUCTOR *J. Franco* QA

CUSTOMER *J. Franco*

| AMS02-PDS   |  | PDS-PR-CGS-006  |                                 | PDS-RP-CGS-072                                 |  |
|---|--|---|---------------------------------|--|--|
|   |  | Ediz.: 2  | Date: 10/06/2009                | Ediz.: 1                                       | Data: Date: 27/06/2009                         |
|   |  | Issue:  | /Issue:                         | Issue:   | /Issue:  |
| AMS02-PDS PFM FULL FUNCTIONAL TEST REPORT                     |  | Pagina 87 di 370  | Pagina 87 di 370                | Pagina 87 di 370                               | Pagina 87 di 370                               |
|   |  | TEST PROCEDURE REFERENCE  |                                 | TEST REPORT REFERENCE                          |  |
|   |  | S/N FM01  |                                 | S/N  |  |
| STEP n°   | TEST SEQUENCE  | ITEM  | AM502 POWER DISTRIBUTION SYSTEM | C.I.   | PDS 18   |
| UUT DATA :  | Model PFM  | Item  | AM502 POWER DISTRIBUTION SYSTEM | C.I.   | EXPECTED VALUE                                 |
|   |  |   |                                 |  | MEASURED VALUE                                 |
|   |  |   |                                 |  | REMARKS  |
| 3A-2-A.196  | Set the CAN BUS board address to 31  | O_7 Status: SPD2_N<br>O_8 Status: CAB_R   |                                 | ON<br>ON                                       | ON<br>ON                                       |
| 3A-2-A.197  | Select "CAN BUS I/F Side" to B   |   |                                 | 31   | 31   |
| 3A-2-A.198  | Click on Read All command in Digital Readout column                        |   |                                 | B<br>OK  | B<br>OK  |
| Verify the status of the following flags:<br><br>BOARD STATUS |  |   |                                 |  |  |
| 3A-2-A.199  | OVT Alarm  | O_1 Status: ER1_N<br>O_2 Status: TPD2<br>O_3 Status: TPD6<br>O_4 Status: SPD3_N<br>O_5 Status: MPD_N<br>O_6 Status: UPD1<br>O_7 Status: SPD2_N<br>O_8 Status: CAB_R |                                 | NOK<br>OK<br>ON<br>ON<br>ON<br>OFF<br>ON<br>ON | NOK<br>OK<br>ON<br>ON<br>ON<br>OFF<br>ON<br>ON |
| 3A-2-A.200  | Set OFF in the window All Outlets ON/OFF and push the relative "W" command |   |                                 | ON<br>ON                                       | ON<br>ON                                       |
| 3A-2-A.201  | Disconnect the short circuit simulator from outlet cables                  |   |                                 | OK<br>OK                                       | OK<br>OK                                       |
| 3A-2-A.202  | Disconnect current probe   |   |                                 | OK<br>OK                                       | OK<br>OK                                       |
| 3A-2-A.203  | Connect outlet cables to active load                                       |   |                                 | OK<br>OK                                       | OK<br>OK                                       |
| 3A-2-A.204  | Set ON in All outlets ON/OFF command and push on the relative "W" command  |   |                                 | OK<br>OK                                       | OK<br>OK                                       |
| Verify the status of the following flags:<br><br>BOARD STATUS |  |   |                                 |  |  |
| 3A-2-A.205  | OVT Alarm  | From O_1 Status: ER1_N to O_8 Status: CAB_R   |                                 | OK<br>OK<br>ON                                 | OK<br>OK<br>ON                                 |
| 3A-2-A.206  | Set the CAN BUS board address to 30  |   |                                 | 30   | 30   |
| 3A-2-A.207  | Select "CAN BUS I/F Side" to A   |   |                                 | A  | A  |
| 3A-2-A.208  | Set OFF in the window All Outlets ON/OFF and push the relative "W" command |   |                                 | OK<br>OK                                       | OK<br>OK                                       |
| 3A-2-A.209  | Click on Read All command in Digital Readout column                        |   |                                 | OK<br>OK                                       | OK<br>OK                                       |
| Verify the status of the following flags:<br><br>BOARD STATUS |  |   |                                 |  |  |
| 3A-2-A.210  | OVT Alarm  | From O_1 Status: ER1_N to O_8 Status: CAB_R   |                                 | OK<br>OK<br>OFF                                | OK<br>OK<br>OFF                                |
| 3A-2-A.211  | Set ON in All outlets ON/OFF command and push on the relative "W" command  |   |                                 | OK<br>OK                                       | OK<br>OK                                       |
| 3A-2-A.212  | Click on Read All command in Digital Readout column                        |   |                                 | OK<br>OK                                       | OK<br>OK                                       |
| 3A-2-A.213  | Verify the status of the following flags:                                  |   |                                 |  |  |
| DATE: 11.06.09  | TEST CONDUCTOR   | QA  |                                 |  | CUSTOMER                                       |

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|   |   |  |
|---|---|--|
| <br><b>CARLO GAVAZZI</b><br><b>CARLO GAVAZZI SPACE SpA</b> | <h1>AMS02-PDS</h1> <p>AMS02-PDS PFM FULL FUNCTIONAL TEST REPORT</p> |  |
|   |   | N° Doc:<br>Doc N°:<br>Ediz.:<br>Issue: |
| UUT DATA :  | Model   | PFM                                    |
| STEP n°   | TEST SEQUENCE   |  |

### 10.3.1.5.6.6 ESEM 3A-2 OUT 6 CURRENT LIMITERS

| STEP n°    | TEST SEQUENCE  | Item | AMS02 POWER DISTRIBUTION SYSTEM | C.I. | PDS 18         | S/N            | FM01 | TEST REPORT REFERENCE                |
|------------|--|------|---------------------------------|------|----------------|----------------|------|--------------------------------------|
|            | BOARD STATUS   |      |                                 |      | EXPECTED VALUE | MEASURED VALUE |      | REMARKS                              |
| 3A-2-A.215 | Click on Read All command in Digital Readout column  |      |                                 |      | OK             | OK             | OK   |                                      |
| 3A-2-A.216 | Verify the status of the following flags:<br>BOARD STATUS  |      |                                 |      | OK             | OK             | OK   |                                      |
| 3A-2-A.216 | OVT Alarm  |      |                                 |      | OK             | OFF            | OFF  |                                      |
|            | From O_1 CMD: ER1_N to O_B CMD: CAB_R  |      |                                 |      | OK             | OFF            | OFF  |                                      |
|            | From O_1 Status: ER1_N to O_B Status: CAB_R  |      |                                 |      | OK             | OFF            | OFF  |                                      |
| 3A-2-A.217 | Current limiters test  |      |                                 |      | OK             | OK             | OK   |                                      |
| 3A-2-A.218 | Set Off in All outlets ON/OFF command and push on the relative "W" command   |      |                                 |      | OK             | OK             | OK   |                                      |
| 3A-2-A.219 | Disconnect outlet cables   |      |                                 |      | OK             | OK             | OK   |                                      |
| 3A-2-A.220 | Connect outlet cables to short circuit simulator without amperometer   |      |                                 |      | OK             | OK             | OK   |                                      |
| 3A-2-A.221 | Set short circuit simulator to 3ms   |      |                                 |      | OK             | OK             | OK   |                                      |
| 3A-2-A.222 | Set ON in All outlets ON/OFF command and push on the relative "W" command  |      |                                 |      | OK             | OK             | OK   |                                      |
| 3A-2-A.223 | Click on Read all in Digital readout column and verify from outlet status located in Digital readout column<br>that all outlets are on |      |                                 |      | OK             | OK             | OK   |                                      |
| 3A-2-A.224 | Create short circuit pressing start button on short circuit simulator  |      |                                 |      | OK             | OK             | OK   |                                      |
| 3A-2-A.225 | Verify the status of the following flags:<br>BOARD STATUS  |      |                                 |      | OK             | OK             | OK   |                                      |
| 3A-2-A.226 | Click on Read all in Digital readout column and verify from outlet status located in Digital readout column<br>that all outlets are on |      |                                 |      | OK             | OK             | OK   |                                      |
| 3A-2-A.227 | Set short circuit simulator to 10ms short circuit duration   |      |                                 |      | OK             | OK             | OK   |                                      |
| 3A-2-A.228 | Monitor the short circuit current with a current probe (Ch1 of oscilloscope)   |      |                                 |      | OK             | OK             | OK   |                                      |
| 3A-2-A.229 | Monitor the 28V of a different outlet of Esem3A under test (Ch2 of oscilloscope)   |      |                                 |      | OK             | OK             | OK   |                                      |
| 3A-2-A.230 | Create the short circuit pressing start button on short circuit simulator  |      |                                 |      | OK             | OK             | OK   | Add Annex_ 14 in the end of document |
| 3A-2-A.230 | Make an hardcopy of the oscilloscope measurements  |      |                                 |      | 6,50A±10%      | 6,37A          |      |                                      |
| 3A-2-A.231 | Measure in the previous picture the current limitation value   |      |                                 |      | 5ms<τ lim<6ms  | 5,26ms         |      |                                      |
| 3A-2-A.232 | Measure in previous picture the current limitation time  |      |                                 |      | 0,00V±1,00V    | 0,00V          |      |                                      |
| 3A-2-A.233 | Verify with multimeter the absence of output voltage across load 6   |      |                                 |      | OK             | OK             |      |                                      |
| 3A-2-A.234 | Click on Read All command in Digital Readout column  |      |                                 |      |                |                |      |                                      |
| 3A-2-A.235 | Verify the status of the following flags:  |      |                                 |      |                |                |      |                                      |

|  |                                  |    |                    |
|--|----------------------------------|----|--------------------|
| DATE: 11.06.09   | TEST CONDUCTOR <i>G. F. 2010</i> | QA | CUSTOMER <i>AZ</i> |
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| CARLO GAVAZZI           |  | AMS02-PDS                                 |      | N° Doc: PDS-PR-CCS-006<br>Doc N°: 2<br>Ediz.: 2<br>Issue: 10/06/2009<br>Data: Date:<br>Pagina 89 di 370<br>Page: 89 di 370 | N° Doc: PDS-RP-CGS-072<br>Doc N°: 1<br>Ediz.: 1<br>Issue: 27/06/2009<br>Data: Date:<br>Pagina 89 di 370<br>Page: 89 di 370 |
|-------------------------|--|---|------|--|--|
| CARLO GAVAZZI SPACE SpA |  | AMS02-PDS PFM FULL FUNCTIONAL TEST REPORT |      |  |  |
| UUT DATA :              | Model  | PFM                                       | Item | AM502 POWER DISTRIBUTION SYSTEM  | C.I. PDS 18 FM01   |
| STEP n°                 | TEST SEQUENCE  |   |      |  |  |
|                         | BOARD STATUS   |   |      |  |  |
|                         | OVT Alarm  |   |      |  |  |
|                         | O_1 Status: ER1_N  |   |      |  |  |
|                         | O_2 Status: TPD2   |   |      |  |  |
|                         | O_3 Status: TPD6   |   |      |  |  |
|                         | O_4 Status: SPD3_N   |   |      |  |  |
|                         | O_5 Status: MPD_N  |   |      |  |  |
|                         | O_6 Status: UPD1   |   |      |  |  |
|                         | O_7 Status: SPD2_N   |   |      |  |  |
|                         | O_8 Status: CAB_R  |   |      |  |  |
| 3A-2-A-236              | Set the CAN BUS board address to 31  |   |      |  |  |
| 3A-2-A-237              | Select "CAN BUS I/F Side" to B   |   |      |  |  |
| 3A-2-A-238              | Click on Read All command in Digital Readout column                        |   |      |  |  |
|                         | Verify the status of the following flags:                                  |   |      |  |  |
|                         | BOARD STATUS   |   |      |  |  |
|                         | OVT Alarm  |   |      |  |  |
|                         | O_1 Status: ER1_N  |   |      |  |  |
|                         | O_2 Status: TPD2   |   |      |  |  |
| 3A-2-A-239              | O_3 Status: TPD6   |   |      |  |  |
|                         | O_4 Status: SPD3_N   |   |      |  |  |
|                         | O_5 Status: MPD_N  |   |      |  |  |
|                         | O_6 Status: UPD1   |   |      |  |  |
|                         | O_7 Status: SPD2_N   |   |      |  |  |
|                         | O_8 Status: CAB_R  |   |      |  |  |
| 3A-2-A-240              | Set OFF in the window All Outlets ON/OFF and push the relative "W" command |   |      |  |  |
| 3A-2-A-241              | Disconnect the short circuit simulator from outlet cables                  |   |      |  |  |
| 3A-2-A-242              | Disconnect current probe   |   |      |  |  |
| 3A-2-A-243              | Connect outlet cables to active load                                       |   |      |  |  |
| 3A-2-A-244              | Set ON in All outlets ON/OFF command and push on the relative "W" command  |   |      |  |  |
|                         | Verify the status of the following flags:                                  |   |      |  |  |
|                         | BOARD STATUS   |   |      |  |  |
|                         | OVT Alarm  |   |      |  |  |
|                         | From O_1 Status: ER1_N to O_8 Status: CAB_R                                |   |      |  |  |
| 3A-2-A-246              | Set the CAN BUS board address to 30  |   |      |  |  |
| 3A-2-A-247              | Select "CAN BUS I/F Side" to A   |   |      |  |  |
| 3A-2-A-248              | Set OFF in the window All Outlets ON/OFF and push the relative "W" command |   |      |  |  |
| DATE: 11.06.09          | TEST CONDUCTOR   | QA  |      |  |  |
|                         |  |   |      |  | CUSTOMER   |

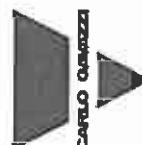
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| <br><b>CARLO GAVAZZI</b><br><b>CARLO GAVAZZI SPACE SpA</b>  | <h1>AMS02-PDS</h1>  |     | N° Doc: <b>PDS-RP-CGS-072</b><br>Doc N°: <b>1</b><br>Ediz.: <b>1</b><br>Issue: <b>1</b><br>Data: <b>27/06/2009</b><br>Date: <b>Date:</b><br>Pagina <b>90</b><br>Page <b>370</b><br>of <b>370</b> |                                 |  |  |
|--|---|-----|--|---------------------------------|--|--|
|  | AMS02-PDS PFM FULL FUNCTIONAL TEST REPORT   |     | TEST PROCEDURE REFERENCE   |                                 |  |  |
| UUT DATA :   | Model   | PFM | Item   | AMS02 POWER DISTRIBUTION SYSTEM |  |  |
| STEP n°  | TEST SEQUENCE   |     | C.I.   | PDS 18                          |  |  |
|  | S/N   |     | S/N  | FM01                            |  |  |
| STEP n°  | TEST SEQUENCE   |     | EXPECTED VALUE   | MEASURED VALUE                  |  |  |
| 3A-2-A.249   | Click on Read All command in Digital Readout column   |     | OK   | OK                              |  |  |
| 3A-2-A.250   | Verify the status of the following flags:<br><br>BOARD STATUS<br>From O_1 Status: ER1_N to O_8 Status: CAB_R  |     | OK<br>OK<br>OFF  | OK<br>OK<br>OFF                 |  |  |
| 3A-2-A.251   | Set ON in All outlets ON/OFF command and push on the relative "W" command   |     | OK   | OK                              |  |  |
| 3A-2-A.252   | Click on Read All command in Digital Readout column   |     | OK   | OK                              |  |  |
| 3A-2-A.253   | Verify the status of the following flags:<br><br>BOARD STATUS<br>From O_1 Status: ER1_N to O_8 Status: CAB_R  |     | OK<br>OK<br>ON   | OK<br>OK<br>ON                  |  |  |
| 3A-2-A.254   | Set OFF in the window All Outlets ON/OFF and push the relative "W" command  |     | OK   | OK                              |  |  |
| <b>10.3.1.5.6.7 ESEM 3A-2 OUT 7 CURRENT LIMITERS</b>   |   |     |  |                                 |  |  |
| 3A-2-A.255   | Click on Read All command in Digital Readout column   |     | OK   | OK                              |  |  |
| 3A-2-A.256   | Verify the status of the following flags:<br><br>BOARD STATUS<br>From O_1 CMD: ER1_N to O_8 CMD: CAB_R<br>From O_1 Status: ER1_N to O_8 Status: CAB_R |     | OK<br>OK<br>OFF<br>OFF   | OK<br>OK<br>OFF<br>OFF          |  |  |
| 3A-2-A.257   | Disconnect outlet cables  |     | OK   | OK                              |  |  |
| 3A-2-A.258   | Connect outlet cables to short circuit simulator without ammeter  |     | OK   | OK                              |  |  |
| 3A-2-A.259   | Set short circuit simulator to 3ms  |     | OK   | OK                              |  |  |
| 3A-2-A.260   | Set ON in All outlets ON/OFF command and push on the relative "W" command   |     | OK   | OK                              |  |  |
| 3A-2-A.261   | Click on Read all in Digital readout column and verify from outlet status located in Digital readout column that all outlets are on                   |     | OK   | OK                              |  |  |
| 3A-2-A.262   | Create short circuit pressing start button on short circuit simulator   |     | OK   | OK                              |  |  |
| 3A-2-A.263   | Verify the status of the following flags:<br><br>BOARD STATUS   |     | OK   | OK                              |  |  |
| 3A-2-A.264   | Click on Read all in Digital readout column and verify from outlet status located in Digital readout column that all outlets are on                   |     | OK   | OK                              |  |  |
| 3A-2-A.265   | Set short circuit simulator to 10ms short circuit duration  |     | OK   | OK                              |  |  |
| 3A-2-A.266   | Monitor the short circuit current with a current probe (Ch1 of oscilloscope)  |     | OK   | OK                              |  |  |
| 3A-2-A.267   | Monitor the 28V of a different outlet of Esem3A under test (Ch2 of oscilloscope)  |     | OK   | OK                              |  |  |
| DATE: 11.06.09   | TEST CONDUCTOR <i>Giovanni</i>  | QA  | <i>Carlo</i>   |                                 |  |  |
| CUSTOMER   |   |     |  |                                 |  |  |
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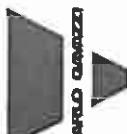
| AMS02-PDS                |  | PDS-PR-CGS-006                         |                         | PDS-RP-CGS-072                  |                         |
|--------------------------|--|--|-------------------------|---------------------------------|-------------------------|
|                          |  | N° Doc.<br>Doc N°:<br>Ediz.:<br>Issue: | Data:<br>Date:<br>Date: | 1                               | Data:<br>Date:<br>Date: |
|                          |  | Pagina<br>Page                         | 91<br>di<br>of          | 91<br>di<br>of                  | 27/06/2009<br>370       |
| TEST PROCEDURE REFERENCE |  |  | TEST REPORT REFERENCE   |                                 |                         |
|                          |  |  | S/N                     | FM01                            |                         |
| UUT DATA :               | Model  | PFM                                    | Item                    | AM502 POWER DISTRIBUTION SYSTEM | C.I.                    |
| STEP n°                  | TEST SEQUENCE  |  |                         | EXPECTED<br>VALUE               | MEASURED<br>VALUE       |
|                          |  |  |                         |                                 | REMARKS                 |
| 3A-2-A.268               | Make a hardcopy of the oscilloscope measurements                           |  |                         | OK                              | OK                      |
| 3A-2-A.269               | Measure in the previous picture the current limitation value               |  |                         | 6.50A±10%                       | 6.28A                   |
| 3A-2-A.270               | Measure in previous picture the current limitation time                    |  |                         | 5ms<T lim<6ms                   | 5.11ms                  |
| 3A-2-A.271               | Verify with multimeter the absence of output voltage across load 7         |  |                         | 0.00V±1.00V                     | 0.00V                   |
| 3A-2-A.272               | Click on Read All command in Digital Readout column                        |  |                         | OK                              | OK                      |
|                          | Verify the status of the following flags:                                  |  |                         |                                 |                         |
|                          | BOARD STATUS   |  |                         |                                 |                         |
|                          | OVT Alarm  |  |                         |                                 |                         |
|                          | O_1 Status: ER1_N  |  |                         | OK                              | OK                      |
|                          | O_2 Status: TPD2   |  |                         | ON                              | ON                      |
|                          | O_3 Status: TPD6   |  |                         | ON                              | ON                      |
|                          | O_4 Status: SPD3_N   |  |                         | ON                              | ON                      |
|                          | O_5 Status: MPD_N  |  |                         | ON                              | ON                      |
|                          | O_6 Status: UPD1   |  |                         | ON                              | ON                      |
|                          | O_7 Status: SPD2_N   |  |                         | OFF                             | OFF                     |
|                          | O_8 Status: CAB_R  |  |                         | ON                              | ON                      |
| 3A-2-A.273               |  |  |                         |                                 |                         |
|                          | Set the CAN BUS board address to 31  |  |                         | 31                              | 31                      |
| 3A-2-A.274               | Select "CAN BUS I/F Side" to B   |  |                         | B                               | B                       |
| 3A-2-A.275               | Click on Read All command in Digital Readout column                        |  |                         | OK                              | OK                      |
| 3A-2-A.276               | Verify the status of the following flags:                                  |  |                         |                                 |                         |
|                          | BOARD STATUS   |  |                         |                                 |                         |
|                          | OVT Alarm  |  |                         |                                 |                         |
|                          | O_1 Status: ER1_N  |  |                         | OK                              | OK                      |
|                          | O_2 Status: TPD2   |  |                         | ON                              | ON                      |
|                          | O_3 Status: TPD6   |  |                         | ON                              | ON                      |
|                          | O_4 Status: SPD3_N   |  |                         | ON                              | ON                      |
|                          | O_5 Status: MPD_N  |  |                         | ON                              | ON                      |
|                          | O_6 Status: UPD1   |  |                         | ON                              | ON                      |
|                          | O_7 Status: SPD2_N   |  |                         | OFF                             | OFF                     |
|                          | O_8 Status: CAB_R  |  |                         | ON                              | ON                      |
| 3A-2-A.277               |  |  |                         |                                 |                         |
|                          | Set OFF in the window All Outlets ON/OFF and push the relative "W" command |  |                         | OK                              | OK                      |
| 3A-2-A.278               | Disconnect the short circuit simulator from outlet cables                  |  |                         | OK                              | OK                      |
| 3A-2-A.279               | Disconnect current probe   |  |                         | OK                              | OK                      |
| 3A-2-A.280               | Connect outlet cables to active load                                       |  |                         | OK                              | OK                      |
| 3A-2-A.281               | Set ON in All outlets ON/OFF command and push on the relative "W" command  |  |                         | OK                              | OK                      |
| 3A-2-A.282               | Verify the status of the following flags:                                  |  |                         | OK                              | OK                      |
| 3A-2-A.283               | BOARD STATUS   |  |                         | OK                              | OK                      |
|                          | TEST CONDUCTOR   |  | QA                      |                                 |                         |
| DATE: 11.06.09           |  |  |                         | CUSTOMER                        |                         |

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|  <p><b>AMSO2-PDS</b></p> <p>CARLO GAVAZZI SPACE SpA</p> |   | <p>N° Doc: PDS-PR-CGS-006<br/>Doc N°: 2<br/>Ediz.: Data: 10/06/2009<br/>Issue: Date:<br/>Pagina 93 di 370<br/>Page</p> <p>N° Doc: PDS-RP-CGS-072<br/>Doc N°: 1<br/>Ediz.: Data: 27/06/2009<br/>Issue: Date:<br/>Pagina 93 di 370<br/>Page</p> |                                     |
|--|---|---|-------------------------------------|
| <p>AMSO2-PDS PFM FULL FUNCTIONAL TEST REPORT</p>   |   | <p>TEST PROCEDURE REFERENCE</p>   |                                     |
| UUT DATA :   | Model   | PFM   | Item                                |
| STEP n°  | TEST SEQUENCE   | C.I.  | PDS 18                              |
| S/N  | FM01  | MEASURED VALUE  | REMARKS                             |
| 3A-2-A.302   | Click on Read all in Digital readout column and verify from outlet status located in Digital readout column that all outlets are on | OK  | OK                                  |
| 3A-2-A.303   | Set short circuit simulator to 10ms short circuit duration  | OK  | OK                                  |
| 3A-2-A.304   | Monitor the short circuit current with a current probe (Ch1 of oscilloscope)  | OK  | OK                                  |
| 3A-2-A.305   | Monitor the 28V of a different outlet of Esem3A under test (Ch2 of oscilloscope)  | OK  | OK                                  |
| 3A-2-A.306   | Create the short circuit pressing start button on short circuit simulator   | OK  | OK                                  |
| 3A-2-A.307   | Make an hardcopy of the oscilloscope measurements   | OK  | Add Annex 16 in the end of document |
| 3A-2-A.308   | Measure in the previous picture the current limitation value  | 13.00A±10%<br>5ms<T lim<6ms   | 12.57A<br>5.10ms                    |
| 3A-2-A.309   | Measure in previous picture the current limitation time   | 0.00V±1.00V   | 0.00V                               |
| 3A-2-A.310   | Verify with multimeter the absence of output voltage across load 8  | OK  | OK                                  |
| 3A-2-A.310   | Click on Read All command in Digital Readout column   | OK  | OK                                  |
| Verify the status of the following flags:  |   |   |                                     |
| BOARD STATUS   |   |   |                                     |
| OVT Alarm  |   |   |                                     |
| O_1  | Status: ER1_N   | NOK   | NOK                                 |
| O_2  | Status: TPD2  | OK  | OK                                  |
| O_3  | Status: TPDS6   | ON  | ON                                  |
| O_4  | Status: SPD3_N  | ON  | ON                                  |
| O_5  | Status: MPD_N   | ON  | ON                                  |
| O_6  | Status: UPD1  | ON  | ON                                  |
| O_7  | Status: SPD2_N  | ON  | ON                                  |
| O_8  | Status: CAB_R   | OFF   | OFF                                 |
| 3A-2-A.311   | Set the CAN BUS board address to 31   | 31  | 31                                  |
| 3A-2-A.312   | Select 'CAN BUS If Side' to B   | B   | B                                   |
| 3A-2-A.313   | Click on Read All command in Digital Readout column   | OK  | OK                                  |
| 3A-2-A.314   | Verify the status of the following flags:   | NOK   | NOK                                 |
| BOARD STATUS   |   |   |                                     |
| OVT Alarm  |   |   |                                     |
| O_1  | Status: ER1_N   | OK  | OK                                  |
| O_2  | Status: TPD2  | ON  | ON                                  |
| O_3  | Status: TPDS6   | ON  | ON                                  |
| O_4  | Status: SPD3_N  | ON  | ON                                  |
| O_5  | Status: MPD_N   | ON  | ON                                  |
| O_6  | Status: UPD1  | ON  | ON                                  |
| O_7  | Status: SPD2_N  | ON  | ON                                  |
| O_8  | Status: CAB_R   | OFF   | OFF                                 |
| 3A-2-A.315   | Set OFF in the window All Outlets ON/OFF and push the relative "W" command  | OK  | OK                                  |
| 3A-2-A.316   | Set OFF in the window All Outlets ON/OFF and push the relative "W" command  | OK  | Protection reset                    |
| DATE: 11.06.09   | TEST CONDUCTOR <i>J.Fioro</i>   | QA  | CUSTOMER <i>J.Fioro</i>             |

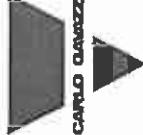
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|---|--|--|
| <br><b>CARLO GAVAZZI</b> | <h1><b>AMS02-PDS</b></h1>                        |  |
|   | <b>AMS02-PDS PFM FULL FUNCTIONAL TEST REPORT</b> |  |
| <b>CARLO GAVAZZI SPACE SpA</b>  |  |  |

| UUT DATA : |   | Model | PFM | Item | AMS02 POWER DISTRIBUTION SYSTEM | C.I.           | PDS 18         | S/N  | FM01 | TEST REPORT REFERENCE |
|------------|---|-------|-----|------|---------------------------------|----------------|----------------|--|------|-----------------------|
| STEP n°    | TEST SEQUENCE   |       |     |      |                                 | EXPECTED VALUE | MEASURED VALUE | REMARKS  |      |                       |
| 3A-2-A-317 | Disconnect the short circuit simulator from outlet cables                 |       |     |      |                                 | OK             | OK             | OK   |      |                       |
| 3A-2-A-318 | Disconnect current probe  |       |     |      |                                 | OK             | OK             | OK   |      |                       |
| 3A-2-A-319 | Connect outlet cables to active load                                      |       |     |      |                                 | OK             | OK             | OK   |      |                       |
| 3A-2-A-320 | Set ON in All outlets ON/OFF command and push on the relative "W" command |       |     |      |                                 | OK             | OK             | OK   |      |                       |
|            | Verify the status of the following flags:                                 |       |     |      |                                 |                |                | In order to verify that CAN BUS 30 is able to reset a protection |      |                       |
| 3A-2-A-321 | BOARD STATUS  |       |     |      |                                 | OK             | OK             | OK   |      |                       |
|            | OVT Alarm   |       |     |      |                                 | ON             | ON             | ON   |      |                       |
| 3A-2-A-322 | From O_1 Status: ER1_N to O_8 Status: CAB_R                               |       |     |      |                                 | 30             | 30             | 30   |      |                       |
| 3A-2-A-323 | Set the CAN BUS board address to 30                                       |       |     |      |                                 |                |                | In order to verify that CAN BUS 30 is able to reset a protection |      |                       |
|            | Select "CAN BUS I/F Side" to A  |       |     |      |                                 | A              | A              | OK   |      |                       |
| 3A-2-A-324 | From O_1 Status: ER1_N to O_8 Status: CAB_R                               |       |     |      |                                 | OK             | OK             | OK   |      |                       |
| 3A-2-A-325 | Set OFF in All outlets ON/OFF and push the relative "W" command           |       |     |      |                                 | OK             | OK             | OK   |      |                       |
|            | Click on Read All command in Digital Readout column                       |       |     |      |                                 |                |                | OK   |      |                       |
|            | Verify the status of the following flags:                                 |       |     |      |                                 |                |                | OK   |      |                       |
| 3A-2-A-326 | BOARD STATUS  |       |     |      |                                 | OK             | OK             | OK   |      |                       |
|            | OVT Alarm   |       |     |      |                                 | OK             | OK             | OK   |      |                       |
| 3A-2-A-327 | From O_1 Status: ER1_N to O_8 Status: CAB_R                               |       |     |      |                                 | OFF            | OFF            | OFF  |      |                       |
|            | Set ON in All outlets ON/OFF command and push on the relative "W" command |       |     |      |                                 |                |                | OK   |      |                       |
| 3A-2-A-328 | Click on Read All command in Digital Readout column                       |       |     |      |                                 | OK             | OK             | OK   |      |                       |
|            | Verify the status of the following flags:                                 |       |     |      |                                 |                |                | OK   |      |                       |
| 3A-2-A-329 | BOARD STATUS  |       |     |      |                                 | OK             | OK             | OK   |      |                       |
|            | OVT Alarm   |       |     |      |                                 | ON             | ON             | ON   |      |                       |
| 3A-2-A-330 | From O_1 Status: ER1_N to O_8 Status: CAB_R                               |       |     |      |                                 | OK             | OK             | OK   |      |                       |
|            | Set OFF in All outlets ON/OFF and push the relative "W" command           |       |     |      |                                 |                |                | OK   |      |                       |

|                |                               |                   |                         |
|----------------|-------------------------------|-------------------|-------------------------|
| DATE: 11.06.09 | TEST CONDUCTOR <i>J. 2010</i> | QA <i>J. 2010</i> | CUSTOMER <i>J. 2010</i> |
|----------------|-------------------------------|-------------------|-------------------------|

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|  <p><b>AMSO2-PDS</b></p> <p>CARLO GAVAZZI SPACE SpA</p> |                       | <p>N° Doc: PDS-RP-CGS-072<br/>Doc N°: PDS-PR-CGS-006</p> <p>Ediz.: 2 Data: 10/06/2009<br/>Issue: 1 Date: 27/06/2009</p> <p>Pagina 95 di 370<br/>Page 95 di 370</p> |                                 |
|--|-----------------------|--|---------------------------------|
| <p>AMSO2-PDS PFM FULL FUNCTIONAL TEST REPORT</p>   |                       | <p>TEST PROCEDURE REFERENCE</p>  |                                 |
| UUT DATA :   | Model                 | PFM  | Item                            |
| STEP n°  | TEST SEQUENCE         | C.I.   | PDS 18                          |
| S/N  | TEST REPORT REFERENCE | S/N  | FM01                            |
| STEP n°  | TEST SEQUENCE         | EXPECTED VALUE   | MEASURED VALUE                  |
| UUT DATA :   | Model                 | PFM  | AMSO2 POWER DISTRIBUTION SYSTEM |
| STEP n°  | TEST SEQUENCE         | C.I.   | TEST PROCEDURE REFERENCE        |
| S/N  | TEST REPORT REFERENCE | S/N  | REMARKS                         |

### 10.3.1.5.7 PB2-3 SIDE A

|            |  |                   |                   |
|------------|--|-------------------|-------------------|
| PB2-3-A.1  | Connect AI 120V and AI 120V RTN power supply signals                                   | OK                | OK                |
| PB2-3-A.2  | Verify that all the cables of the section are connected                                | OK                | OK                |
| PB2-3-A.3  | Launch the PDS controller software   | Program open      | Program open      |
| PB2-3-A.4  | Set to "FM" the window Model   | OK                | OK                |
| PB2-3-A.5  | set the CAN BUS board address to 30  | 30                | 30                |
| PB2-3-A.6  | select "MDC = 0  | 0                 | 0                 |
| PB2-3-A.7  | select TX = A  | A                 | A                 |
| PB2-3-A.8  | select RX = A  | A                 | A                 |
| PB2-3-A.9  | Select "CAN BUS I/F Side" to A   | A                 | A                 |
| PB2-3-A.10 | Select "PDS Side" to A   | A                 | A                 |
| PB2-3-A.11 | Set input bus voltage to 120V  | 120V±1V           | 120.0V            |
| PB2-3-A.12 | Set input bus current limitation to 27.5 A   | 27.5 A±1A         | 27.5A             |
| PB2-3-A.13 | Enable power supply output   | enabled           | enabled           |
| PB2-3-A.14 | Verify that green led of "power switch box" is lighted                                 | Green led lighted | Green led lighted |
| PB2-3-A.15 | Switch ON the "power switch box"   | Switch ON         | Switch ON         |
| PB2-3-A.16 | Verify that red led of "power switch box" is lighted                                   | Red led lighted   | Red led lighted   |
| PB2-3-A.17 | Take note of power supply output current   | 1.1A±0.5A         | 1.1A              |
| PB2-3-A.18 | Click on Run flash button  | OK                | OK                |
| PB2-3-A.19 | Set the CAN BUS board address to 31  | 31                | 31                |
| PB2-3-A.20 | Select "CAN BUS I/F Side" to B   | B                 | B                 |
| PB2-3-A.21 | Click on Run flash button  | OK                | OK                |
| PB2-3-A.22 | Set the CAN BUS board address to 30  | 30                | 30                |
| PB2-3-A.23 | Select "CAN BUS I/F Side" to A   | A                 | A                 |
| PB2-3-A.24 | Click on PB2-3 button  | OK                | OK                |
| PB2-3-A.25 | Set Digital I/F Test logic value = 1 in "Commanding" column                            | 1                 | 1                 |
| PB2-3-A.26 | Click on letter "W" on the right of the "1" value                                      | OK                | OK                |
| PB2-3-A.27 | Click on the command READ ALL under the column Digital Readout                         | OK                | OK                |
| PB2-3-A.28 | Verify that in the column Digital Readout under the voice Digital I/F Test appears "1" | 1                 | 1                 |
| PB2-3-A.29 | Set Digital I/F Test logic value = 0 in "Commanding" column                            | 0                 | 0                 |
| PB2-3-A.30 | Click on letter "W" on the right of the "0" value                                      | OK                | OK                |
| PB2-3-A.31 | Click on the command READ ALL under the column Digital Readout                         | OK                | OK                |
| PB2-3-A.32 | Verify that in the column Digital Readout under the voice Digital I/F Test appears "0" | 0                 | 0                 |
| PB2-3-A.33 | Click on the command READ ALL under the column Digital Readout                         | OK                | OK                |

DATE: 12.06.09 TEST CONDUCTOR *Q.Franco*

QA



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| AMS02-PDS      |  |     |      | N° Doc:<br>Doc N°:<br>Ediz.:<br>Issue: | PDS-PR-CGS-006<br>2<br>Data:<br>10/06/2009<br>Pagina<br>Page<br>96<br>di<br>370 | N° Doc:<br>Doc N°:<br>Ediz.:<br>Issue:<br>Pagina<br>Page<br>96<br>di<br>370 | PDS-RP-CGS-072<br>1<br>Data:<br>27/06/2009 |
|----------------|--|-----|------|--|---|---|--|
| UUT DATA :     | Model  | PFM | Item | AMS02 POWER DISTRIBUTION SYSTEM        | C.I.  | TEST PROCEDURE REFERENCE  | TEST REPORT REFERENCE                      |
| STEP n°        | TEST SEQUENCE  |     |      |  | EXPECTED<br>VALUE   | MEASURED<br>VALUE   | REMARKS                                    |
|                | Verify the status of the following flags:<br>BOARD STATUS<br>OVT ALARM<br>Input OVC Alarm<br>DCDC ON/OFF<br>27V UV<br>29V Trip<br>DCDC OFF/ON CMD  |     |      |  | OK<br>OK<br>OK<br>OFF<br>OK<br>OK<br>OFF  | OK<br>OK<br>OK<br>OFF<br>OK<br>OK<br>OFF                                    | OK<br>OK<br>OK<br>OFF<br>OK<br>OK<br>OFF   |
| PB2-3-A.35     | Click on the command READ ALL under the column Analog Readout  |     |      |  | OK  | OK  | OK   |
| PB2-3-A.36     | Verify the value of the following telemetries:<br>Temperature<br>Output Voltage<br>Analog Ref. 2.0V  |     |      |  | -40°C < T < 80°C<br>0,00V ±1,00V<br>2,0000V ±150mV                              | 27,80°C<br>-0,017V<br>2,034V  |  |
| PB2-3-A.37     | Set the CAN BUS board address to 31  |     |      |  | 31  | B   | B  |
| PB2-3-A.38     | Select "CAN BUS I/F Side" to B   |     |      |  | OK  | OK  | OK   |
| PB2-3-A.39     | Click on the command READ ALL under the column Digital Readout   |     |      |  | OK  | OK  | OK   |
|                | Verify the status of the following flags:<br>BOARD STATUS<br>OVT ALARM<br>Input OVC Alarm<br>DCDC ON/OFF<br>27V UNV<br>29V Trip<br>DCDC OFF/ON CMD |     |      |  | OK<br>OK<br>OK<br>OFF<br>OK<br>OK<br>OFF  | OK<br>OK<br>OK<br>OFF<br>OK<br>OK<br>OFF                                    | OK<br>OK<br>OK<br>OFF                      |
| PB2-3-A.41     | Set ON on DCDC OFF/ON command window and send the command  |     |      |  | OK  | OK  | OK   |
| PB2-3-A.42     | Click on the command READ ALL under the column Digital Readout   |     |      |  | OK  | OK  | OK   |
|                | Verify the status of the following flags:<br>BOARD STATUS<br>OVT ALARM<br>Input OVC Alarm<br>DCDC ON/OFF<br>27V UNV<br>29V Trip<br>DCDC OFF/ON CMD |     |      |  | OK<br>OK<br>OK<br>ON<br>OK<br>OK<br>ON  | OK<br>OK<br>OK<br>ON<br>OK<br>OK<br>ON                                      | OK<br>OK<br>OK<br>ON<br>OK<br>OK<br>ON     |
| PB2-3-A.44     | Click on ESEM 3A-3 button  |     |      |  | OK  | OK  | OK   |
| PB2-3-A.45     | Set ON in the window "O_1: TPDO" and push the relative "W" command   |     |      |  | OK  | OK  | OK   |
| PB2-3-A.46     | Measure with multimeter the voltage on ESEM 3-A-3 out 1 (Check that load is not connected)   |     |      |  | 28,00V ±1,00V   | 28,117V   | V1   |
| PB2-3-A.47     | Click on PB2-3 button  |     |      |  | OK  | OK  | OK   |
| DATE: 11.06.08 | TEST CONDUCTOR <i>J.P. 2010</i>  |     |      | QA                                     | CUSTOMER <i>J.P. 2010</i>   |   |  |

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|---|--|---|-----|--|--|--|--|
| CARLO GAVAZZI SPACE SpA                   |  | AMS02-PDS PFM FULL FUNCTIONAL TEST REPORT |     | 97<br>of                               | 10/06/2009<br>di<br>370                            | 1<br>of                                | 27/06/2009<br>di<br>370                            |
| UUT DATA :                                |  | Model                                     | PFM | Item                                   | AMS02 POWER DISTRIBUTION SYSTEM                    | C.I.                                   | TEST PROCEDURE REFERENCE                           |
| STEP n°                                   | TEST SEQUENCE  |   |     |  |  | S/N                                    | FM01   |
| PB2-3-A.48                                | Click on the command READ ALL under the column Analog Readout              |   |     |  | OK   | OK                                     | OK   |
| PB2-3-A.49                                | Verify the value of the following telemetry:                               |   |     |  | V1±1.092V  | 28.33V                                 | Click on relative Rbutton                          |
| PB2-3-A.50                                | Output Voltage   |   |     |  | OK   | OK                                     | OK   |
| PB2-3-A.51                                | Click on ESEM 3A-3 button  |   |     |  | OK   | OK                                     | OK   |
| PB2-3-A.52                                | Set OFF in the window All Outlets ON/OFF and push the relative "W" command |   |     |  | OK   | 30                                     | 30   |
| PB2-3-A.53                                | Set the CAN BUS board address to 30  |   |     |  | A  | A                                      | A  |
| PB2-3-A.54                                | Select "CAN BUS I/F Side" to A   |   |     |  | OK   | OK                                     | OK   |
| PB2-3-A.55                                | Click on PB2-3 button  |   |     |  | OK   | OK                                     | OK   |
| PB2-3-A.56                                | Click on the command READ ALL under the column Digital Readout             |   |     |  | OK   | OK                                     | OK   |
| Verify the status of the following flags: |  |   |     |  |  |  |  |
| BOARD STATUS                              |  | OK  |     | OK                                     |  | OK                                     |  |
| OVT ALARM                                 |  | OK  |     | OK                                     |  | OK                                     |  |
| Input OVC Alarm                           |  | OK  |     | OK                                     |  | OK                                     |  |
| DCDC ON/OFF                               |  | ON  |     | ON                                     |  | ON                                     |  |
| 27V UNV                                   |  | OK  |     | OK                                     |  | OK                                     |  |
| 29V Trip                                  |  | OK  |     | OK                                     |  | OK                                     |  |
| DCDC OFF/ON CMD                           |  | ON  |     | ON                                     |  | ON                                     |  |

QA

DATE: 11.06.09 TEST CONDUCTOR

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|---|--|---|------|---|--|---|-------------------|--|---|--|
| CARLO GAVAZZI SPACE SpA                                     |  | AMS02-PDS PFM FULL FUNCTIONAL TEST REPORT |      | Data:<br>Date:<br>10/06/2009<br>di<br>of<br>370 |  |   |                   |  |   |  |
| UUT DATA :  | Model  | PFM                                       | Item | AMS02 POWER DISTRIBUTION SYSTEM                 | C.I.   | TEST PROCEDURE REFERENCE  | SIN               | FM01   | TEST REPORT REFERENCE                           |  |
| STEP n°   | TEST SEQUENCE  |   |      |   |  | EXPECTED<br>VALUE   | MEASURED<br>VALUE |  | REMARKS   |  |
| 3A-3-A.1  | Click on ESEM3-A-3 button  |   |      |   | OK   | OK  | OK                |  | Button located on left side of software window  |  |
| 3A-3-A.2  | Connect to active loads outlet 1, 2, 3, 4, 5, 6, 7 and 8.  |   |      |   | OK   | OK  | OK                |  |   |  |
| 3A-3-A.3  | Verify that loads are set to 0A current absorption   |   |      |   | OK   | OK  | OK                |  |   |  |
| 3A-3-A.4  | Set Digital I/F Test logic value = 1 in "Commanding" column  |   |      |   | 1  | 1   | 1                 |  |   |  |
| 3A-3-A.5  | Click on letter "W" on the right of the "1" value  |   |      |   | OK   | OK  | OK                |  |   |  |
| 3A-3-A.6  | Click on the command READ ALL under the column Digital Readout   |   |      |   | OK   | OK  | OK                |  |   |  |
| 3A-3-A.7  | Verify that in the column Digital Readout under the voice Digital I/F Test appears "1"   |   |      |   | 1  | 1   | 1                 |  |   |  |
| 3A-3-A.8  | Set Digital I/F Test logic value = 0 in "Commanding" column  |   |      |   | 0  | 0   | 0                 |  |   |  |
| 3A-3-A.9  | Click on letter "W" on the right of the "0" value  |   |      |   | OK   | OK  | OK                |  |   |  |
| 3A-3-A.10   | Click on the command READ ALL under the column Digital Readout   |   |      |   | OK   | OK  | OK                |  |   |  |
| 3A-3-A.11   | Verify that in the column Digital Readout under the voice Digital I/F Test appears "0"   |   |      |   | 0  | 0   | 0                 |  |   |  |
| Verify the status of the following flags:                   |  |   |      |   |  |   |                   |  |   |  |
| 3A-3-A.12   | BOARD STATUS<br>OVT Alarm  |   |      |   | OK   | OK  | OK                |  |   |  |
|   | From O_1 CMD: TPDO to Q_8 CMD: CAB_N   |   |      |   | OFF  | OFF   | OFF               |  |   |  |
|   | From O_1 Status: TPDO to Q_8 Status: CAB_N   |   |      |   | OFF  | OFF   | OFF               |  |   |  |
| 3A-3-A.13   | Push on Read All button in Analog Readout column   |   |      |   | OK   | OK  | OK                |  |   |  |
| Verify the current telemetries:                             |  |   |      |   |  |   |                   |  |   |  |
| 3A-3-A.14   | O_1 Current: TPDO<br>O_2 Current: TPD4<br>O_3 Current: ER0_N<br>O_4 Current: MPD_R<br>O_5 Current: SPD3_R<br>O_6 Current: UGPD_R<br>O_7 Current: SPD2_R<br>O_8 Current: CAB_N<br>Temperature<br>Analog Ref. 3.0V |   |      |   | 0,000A±0,225A<br>0,000A±0,225A<br>0,000A±0,225A<br>0,000A±0,225A<br>0,000A±0,225A<br>0,000A±0,225A<br>0,000A±0,45A<br>-40°C < T < 80°C<br>3,000V±250mV | -0,025A<br>-0,102A<br>0,012A<br>-0,019A<br>0,070A<br>0,070A<br>0,101A<br>-0,06A<br>30°C<br>3,020V |                   |  |   |  |
| Measure with multimeter the voltage on this ESEM 3-A loads: |  |   |      |   |  |   |                   |  |   |  |
| 3A-3-A.15   | O_1: TPDO<br>O_2: TPD4<br>O_3: ER0_N<br>O_4: MPD_R<br>O_5: SPD3_R<br>O_6: UGPD_R   |   |      |   | 0,00V < V < 1,00V<br>0,00V < V < 1,00V                             | 0,013V<br>0,012V<br>0,015V<br>0,011V<br>0,015V<br>0,015V  |                   |  |   |  |
| DATE: 11.06.09  | TEST CONDUCTOR   |   |      |   | QA   |   |                   |  | CUSTOMER  |  |

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|--|---|---|--|---|
| <b>AMSO2-PDS PFM FULL FUNCTIONAL TEST REPORT</b>   |   | <b>TEST PROCEDURE REFERENCE</b>   |  |   |
| <b>UUT DATA :</b>  | <b>Model</b>  | <b>PFM</b>  | <b>Item</b>  | <b>AMSO2 POWER DISTRIBUTION SYSTEM</b>  |
| STEP n°  | TEST SEQUENCE   | C.I.  | PDS 18   | SIN FM01  |
|  |   |   | EXPECTED VALUE   | MEASURED VALUE  |
| 3A-3-A.16  | Set ON in the window All Outlets ON/OFF and push the relative "W" command<br>Measure with multimeter the voltage on this ESEM 3-A loads:<br>O_1: TP00<br>O_2: TP04<br>O_3: ERO_N<br>O_4: MPD_R<br>O_5: SPD3_R<br>O_6: UGPD_R<br>O_7: SPD2_R<br>O_8: CAB_N |   | 0,00V<V<1,00V<br>0,00V<V<1,00V   | 0,014V<br>0,015V  |
| 3A-3-A.17  |   | OK  | OK   | OK  |
| 3A-3-A.18  | Click on Read All command in Digital Readout column<br>Verify the status of the following flags:<br>BOARD STATUS<br>OVT Alarm<br>From O_1 CMD: TP00 to O_8 CMD: CAB_N<br>From O_1 Status: TP00 to O_8 Status: CAB_N                                       |   | 28,00V±1,00V<br>28,00V±1,00V<br>28,00V±1,00V<br>28,00V±1,00V<br>28,00V±1,00V<br>28,00V±1,00V<br>28,00V±1,00V<br>28,00V±1,00V | 28,17V<br>28,17V<br>28,17V<br>28,17V<br>28,17V<br>28,17V<br>28,17V<br>28,17V  |
| 3A-3-A.19  |   | OK  | OK   | OK  |
| 3A-3-A.20  | Set Off in All outlets ON/OFF command and push on the relative "W" command  | OK  | OK   | OK  |
| 3A-3-A.21  | Click on Raed all to in Digital readout column  | OK  | OK   | OK  |
| 3A-3-A.22  | Verify from digital readout column that all outlets are OFF   | OK  | OK   | OK  |
| <b>10.3.1.5.8.1 ESEM 3A-3 OUT 1 CURRENT LIMITERS</b>   |   |   |  |   |
| 3A-3-A.23  | Disconnect outlet cables  | OK  | OK   | OK  |
| 3A-3-A.24  | Connect outlet cables to short circuit simulator without ammeter  | OK  | OK   | OK  |
| 3A-3-A.25  | Set short circuit simulator to 3ms  | OK  | OK   | OK  |
| 3A-3-A.26  | Set ON in All outlets ON/OFF command and push on the relative "W" command   | OK  | OK   | OK  |
| 3A-3-A.27  | Click on Read all in Digital readout column and verify from outlet status located in Digital readout column that all outlets are on   | OK  | OK   | OK  |
| 3A-3-A.28  | Create short circuit pressing start button on short circuit simulator   | OK  | OK   | OK  |
| 3A-3-A.29  | Verify the status of the following flags:<br>BOARD STATUS   | OK  | OK   | OK  |
| 3A-3-A.30  | Click on Read all in Digital readout column and verify from outlet status located in Digital readout column that all outlets are on   | OK  | OK   | OK  |
| <b>DATE:</b>   | <b>11.06.09</b>   | <b>TEST CONDUCTOR</b>   | <b>QA</b>  | <b>CUSTOMER</b>   |

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|---|--|---|------|--|--|--|--|--|--|
| CARLO GAVAZZI SPACE SpA                                   |  | AMS02-PDS PFM FULL FUNCTIONAL TEST REPORT |      | TEST PROCEDURE REFERENCE               |  | TEST REPORT REFERENCE                  |  |  |  |
| UUT DATA :  | Model  | PFM                                       | Item | AMS02 POWER DISTRIBUTION SYSTEM        | C.I.   | PDS 18                                 | S/N  |  |  |
| STEP n°   | TEST SEQUENCE  |   |      | EXPECTED VALUE                         | MEASURED VALUE   | MEASURED VALUE                         | REMARKS  |  |  |
| 3A-3-A.31   | Set short circuit simulator to 10ms short circuit duration   |   |      | OK                                     | OK   | OK                                     | OK   |  |  |
| 3A-3-A.32   | Monitor the short circuit current with a current probe (Ch1 of oscilloscope)<br>Monitor the 28V of a different outlet of Esem3A under test (Ch2 of oscilloscope) |   |      | OK                                     | OK   | OK                                     | OK   |  |  |
| 3A-3-A.33   | Create the short circuit pressing start button on short circuit simulator  |   |      | OK                                     | OK   | OK                                     | OK   |  |  |
| 3A-3-A.34   | Make an hardcopy of the oscilloscope measurements  |   |      | OK                                     | OK   | OK                                     | Add Annex 17 in the end of document  |  |  |
| 3A-3-A.35   | Measure in the previous picture the current limitation value   |   |      | 6,50A±10%                              | 6,20A  |  |  |  |  |
| 3A-3-A.36   | Measure in previous picture the current limitation time  |   |      | 5ms<T lim<6ms                          | 5,18ms   |  |  |  |  |
| 3A-3-A.37   | Verify with multimeter the absence of output voltage across load 1   |   |      | 0,00V±1,00V                            | 0,00V  |  |  |  |  |
| 3A-3-A.38   | Click on Read All command in Digital Readout column  |   |      | OK                                     | OK   | OK                                     | OK   |  |  |
| Verify the status of the following flags:<br>BOARD STATUS |  |   |      | NOK                                    | NOK  | NOK                                    |  |  |  |
| OVT Alarm   |  |   |      | OK                                     | OK   | OK                                     |  |  |  |
| O_1 Status: TPDO  |  |   |      | OFF                                    | ON   | OFF                                    |  |  |  |
| O_2 Status: TPD4  |  |   |      | ON                                     | ON   | ON                                     |  |  |  |
| O_3 Status: ERO_N   |  |   |      | ON                                     | ON   | ON                                     |  |  |  |
| O_4 Status: MPD_R   |  |   |      | ON                                     | ON   | ON                                     |  |  |  |
| O_5 Status: SPD3_R  |  |   |      | ON                                     | ON   | ON                                     |  |  |  |
| O_6 Status: UGPD_R  |  |   |      | ON                                     | ON   | ON                                     |  |  |  |
| O_7 Status: SPD2_R  |  |   |      | ON                                     | ON   | ON                                     |  |  |  |
| O_8 Status: CAB_N   |  |   |      | ON                                     | ON   | ON                                     |  |  |  |
| 3A-3-A.40   | Set the CAN BUS board address to 31  |   |      | B                                      | B  | B                                      |  |  |  |
| 3A-3-A.41   | Select "CAN BUS I/F Side" to B   |   |      | OK                                     | OK   | OK                                     |  |  |  |
| 3A-3-A.42   | Click on Read All command in Digital Readout column  |   |      | NOK                                    | NOK  | NOK                                    |  |  |  |
| Verify the status of the following flags:<br>BOARD STATUS |  |   |      | OK                                     | OK   | OK                                     |  |  |  |
| OVT Alarm   |  |   |      | OFF                                    | ON   | OFF                                    |  |  |  |
| O_1 Status: TPDO  |  |   |      | ON                                     | ON   | ON                                     |  |  |  |
| O_2 Status: TPD4  |  |   |      | ON                                     | ON   | ON                                     |  |  |  |
| O_3 Status: ERO_N   |  |   |      | ON                                     | ON   | ON                                     |  |  |  |
| O_4 Status: MPD_R   |  |   |      | ON                                     | ON   | ON                                     |  |  |  |
| O_5 Status: SPD3_R  |  |   |      | ON                                     | ON   | ON                                     |  |  |  |
| O_6 Status: UGPD_R  |  |   |      | ON                                     | ON   | ON                                     |  |  |  |
| O_7 Status: SPD2_R  |  |   |      | ON                                     | ON   | ON                                     |  |  |  |
| O_8 Status: CAB_N   |  |   |      | ON                                     | ON   | ON                                     |  |  |  |
| 3A-3-A.44   | Set OFF in the window All Outlets ON/OFF and push the relative "W" command   |   |      | OK                                     | OK   | OK                                     | Protection reset   |  |  |
| 3A-3-A.45   | Disconnect the short circuit simulator from outlet cables  |   |      | OK                                     | OK   | OK                                     |  |  |  |
| DATE: 11.06.09  | TEST CONDUCTOR   | QA  |      |  |  |  | CUSTOMER   |  |  |

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|  <b>CARLO GAVAZZI</b><br><b>CARLO GAVAZZI SPACE SpA</b> |   | <b>AMS02-PDS</b> |      | N° Doc:<br>Doc N°:<br>Ediz.:<br>Issue:<br><br>AMS02-PDS PFM FULL FUNCTIONAL TEST REPORT<br><br>Pagina<br>Page | N° Doc:<br>Doc N°:<br>Ediz.:<br>Issue:<br>Data:<br>Date:<br><br>10/06/2009<br>di<br>370<br>of<br><br>TEST PROCEDURE REFERENCE | N° Doc:<br>Doc N°:<br>Ediz.:<br>Issue:<br>Data:<br>Date:<br><br>1<br>Pagina<br>Page<br><br>101<br>di<br>370<br>of<br><br>TEST REPORT REFERENCE |
|--|---|------------------|------|---|---|--|
| UUT DATA :   | Model   | PFM              | Item | AMS02 POWER DISTRIBUTION SYSTEM   | C.I.  | PDS 18   |
| STEP n°  | TEST SEQUENCE   |                  |      |   | EXPECTED VALUE  | MEASURED VALUE   |
| 3A-3-A.46  | Disconnect current probe  |                  |      |   | OK  | OK   |
| 3A-3-A.47  | Connect outlet cables to active load  |                  |      |   | OK  | OK   |
| 3A-3-A.48  | Set ON in All outlets ON/OFF command and push on the relative "W" command                                       |                  |      |   | OK  | OK   |
|  | Verify the status of the following flags:   |                  |      |   |   |  |
| 3A-3-A.49  | BOARD STATUS<br>OVT Alarm<br>From O_1 Status: TPD0 to O_8 Status: CAB_N   |                  |      |   | OK<br>OK<br>ON  | OK<br>OK<br>ON   |
| 3A-3-A.50  | Set the CAN BUS board address to 30   |                  |      |   | 30  | 30   |
| 3A-3-A.51  | Select "CAN BUS I/F Side" to A  |                  |      |   | A   | A  |
| 3A-3-A.52  | Set OFF in the window All Outlets ON/OFF and push the relative "W" command                                      |                  |      |   | OK  | OK   |
| 3A-3-A.53  | Click on Read All command in Digital Readout column   |                  |      |   | OK  | OK   |
|  | Verify the status of the following flags:   |                  |      |   |   |  |
| 3A-3-A.54  | BOARD STATUS<br>OVT Alarm<br>From O_1 Status: TPD0 to O_8 Status: CAB_N   |                  |      |   | OK<br>OK<br>OFF   | OK<br>OK<br>OFF  |
| 3A-3-A.55  | Set ON in All outlets ON/OFF command and push on the relative "W" command                                       |                  |      |   | OK  | OK   |
| 3A-3-A.56  | Click on Read All command in Digital Readout column   |                  |      |   | OK  | OK   |
|  | Verify the status of the following flags:   |                  |      |   |   |  |
| 3A-3-A.57  | BOARD STATUS<br>OVT Alarm<br>From O_1 Status: TPD0 to O_8 Status: CAB_N   |                  |      |   | OK<br>OK<br>ON  | OK<br>OK<br>ON   |
| 3A-3-A.58  | Set OFF in the window All Outlets ON/OFF and push the relative "W" command                                      |                  |      |   | OK  | OK   |
| <b>10.3.1.5.8.2 ESEM 3A-3 OUT 2 CURRENT LIMITERS</b>   |   |                  |      |   |   |  |
| 3A-3-A.59  | Click on Read All command in Digital Readout column   |                  |      |   | OK  | OK   |
|  | Verify the status of the following flags:   |                  |      |   |   |  |
| 3A-3-A.60  | BOARD STATUS<br>OVT Alarm<br>From O_1 CMD: TPD0 to O_8 CMD: CAB_N<br>From O_1 Status: TPD0 to O_8 Status: CAB_N |                  |      |   | OK<br>OK<br>OFF<br>OFF  | OK<br>OK<br>OFF<br>OFF   |
| 3A-3-A.61  | Disconnect outlet cables  |                  |      |   | OK  | OK   |
| 3A-3-A.62  | Connect outlet cables to short circuit simulator without amperometer  |                  |      |   | OK  | OK   |
| 3A-3-A.63  | Set short circuit simulator to 3ms  |                  |      |   | OK  | OK   |
| 3A-3-A.64  | Set ON in All outlets ON/OFF command and push on the relative "W" command                                       |                  |      |   | OK  | OK   |
| DATE: 11.06.2010   | TEST CONDUCTOR  | QA               |      |   |   | CUSTOMER   |

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| AMS02-PDS      |   |                    |                    | N° Doc:<br>Doc N°:<br>Ediz.:<br>Issue: | PDS-PR-CGS-006<br>Data:<br>Date:<br>2<br>10/06/2009<br>Pagina<br>Page<br>102<br>di<br>370 | N° Doc:<br>Doc N°:<br>Ediz.:<br>Issue: | PDS-RP-CGS-072<br>Data:<br>Date:<br>1<br>102<br>di<br>370 |
|----------------|---|--------------------|--------------------|--|---|--|---|
| UUT DATA :     | Model   | PFM                | Item               | TEST PROCEDURE REFERENCE               |   | TEST REPORT REFERENCE                  |   |
| STEP n°        | TEST SEQUENCE   |                    |                    | C.I.                                   | PDS 18  | S/N                                    | FM01  |
|                |   |                    |                    |  | EXPECTED<br>VALUE   | MEASURED<br>VALUE                      | REMARKS   |
| 3A-3-A.65      | Click on Read all in Digital readout column and verify from outlet status located in Digital readout column that all outlets are on                               |                    |                    |  | OK  | OK                                     |   |
| 3A-3-A.66      | Create short circuit pressing start button on short circuit simulator   |                    |                    |  | OK  | OK                                     |   |
| 3A-3-A.67      | Verify the status of the following flags:<br><b>BOARD STATUS</b>  |                    |                    |  | OK  | OK                                     |   |
| 3A-3-A.68      | Click on Read all in Digital readout column and verify from outlet status located in Digital readout column that all outlets are on                               |                    |                    |  | OK  | OK                                     |   |
| 3A-3-A.69      | Set short circuit simulator to 10ms short circuit duration  |                    |                    |  | OK  | OK                                     |   |
| 3A-3-A.70      | Monitor the short circuit current with a current probe (Ch1 of oscilloscope)<br>Monitor the 28V of a different outlet of Esemt3A under test (Ch2 of oscilloscope) |                    |                    |  | OK  | OK                                     |   |
| 3A-3-A.71      | Create the short circuit pressing start button on short circuit simulator   |                    |                    |  | OK  | OK                                     |   |
| 3A-3-A.72      | Make an hardcopy of the oscilloscope measurements   |                    |                    |  | OK  | OK                                     | Add Annex 18 in the end of document                       |
| 3A-3-A.73      | Measure in the previous picture the current limitation value  |                    |                    |  | 6.50A±10%   | 6.26A                                  |   |
| 3A-3-A.74      | Measure in previous picture the current limitation time   |                    |                    |  | 5ms<T lim<6ms   | 5.09ms                                 |   |
| 3A-3-A.75      | Verify with multimeter the absence of output voltage across load 2  |                    |                    |  | 0.00V±1.00V   | 0.00V                                  |   |
| 3A-3-A.76      | Click on Read All command in Digital Readout column   |                    |                    |  | OK  | OK                                     |   |
|                | Verify the status of the following flags:<br><b>BOARD STATUS</b>  |                    |                    |  |   |  |   |
|                | OVT Alarm   |                    |                    |  |   |  |   |
| 3A-3-A.77      | O_1 Status: TPDO  | O_2 Status: TPDO   | O_3 Status: ERQ_N  |  | NOK   | OK                                     |   |
|                | O_4 Status: MPD_R   | O_5 Status: SPD3_R | O_6 Status: UGPD_R |  | ON  | ON                                     |   |
|                | O_7 Status: SPD2_R  | O_8 Status: CAB_N  |                    |  | OFF   | ON                                     |   |
| 3A-3-A.78      | Set the CAN BUS board address to 31   |                    |                    |  | ON  | ON                                     |   |
| 3A-3-A.79      | Select "CAN BUS I/F_Side" to B  |                    |                    |  | ON  | ON                                     |   |
| 3A-3-A.80      | Click on Read All command in Digital Readout column   |                    |                    |  | ON  | ON                                     |   |
|                | Verify the status of the following flags:<br><b>BOARD STATUS</b>  |                    |                    |  |   |  |   |
|                | OVT Alarm   |                    |                    |  |   |  |   |
| 3A-3-A.81      | O_1 Status: TPDO  | O_2 Status: TPDO   | O_3 Status: ERQ_N  |  | NOK   | OK                                     |   |
|                | O_4 Status: MPD_R   |                    |                    |  | ON  | ON                                     |   |
|                |   |                    |                    |  | OFF   | ON                                     |   |
|                |   |                    |                    |  | ON  | ON                                     |   |
| DATE: 11.06.09 | TEST CONDUCTOR  | QA                 |                    |  |   |  | CUSTOMER  |

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| CARLO GAVAZZI           |  | AMS02-PDS                                 |      | PDS-PR-CGS-006                  |                 | PDS-RP-CGS-072  |  |
|-------------------------|--|---|------|---------------------------------|-----------------|-----------------|--|
| CARLO GAVAZZI SPACE SpA |  | AMS02-PDS PFM FULL FUNCTIONAL TEST REPORT |      | Doc N°:                         | Doc N°:         | Doc N°:         | Doc N°:  |
| UUT DATA :              | Model  | PFM                                       | Item | AMS02 POWER DISTRIBUTION SYSTEM | C.I.            | PDS 18          | TEST PROCEDURE REFERENCE   |
| STEP n°                 | TEST SEQUENCE  |   |      | EXPECTED VALUE                  | MEASURED VALUE  | S/N             | TEST REPORT REFERENCE  |
|                         |  |   |      |                                 |                 |                 |  |
| O_5                     | Status: SPD3_R   |   |      | ON                              | ON              | ON              |  |
| O_6                     | Status: UGPD_R   |   |      | ON                              | ON              | ON              |  |
| O_7                     | Status: SPD2_R   |   |      | ON                              | ON              | ON              |  |
| O_8                     | Status: CAB_N  |   |      | ON                              | ON              | ON              |  |
| 3A-3-A.82               | Set OFF in the window All Outlets ON/OFF and push the relative "W" command   |   |      | OK                              | OK              | OK              | Protection reset   |
| 3A-3-A.83               | Disconnect the short circuit simulator from outlet cables  |   |      | OK                              | OK              | OK              |  |
| 3A-3-A.84               | Disconnect current probe   |   |      | OK                              | OK              | OK              |  |
| 3A-3-A.85               | Connect outlet cables to active load   |   |      | OK                              | OK              | OK              |  |
| 3A-3-A.86               | Set ON in All outlets ON/OFF command and push on the relative "W" command  |   |      | OK                              | OK              | OK              |  |
| 3A-3-A.87               | Verify the status of the following flags:<br>BOARD STATUS<br>OVT Alarm<br>From O_1 Status: TPDO to O_8 Status: CAB_N |   |      | OK<br>OK<br>ON                  | OK<br>OK<br>ON  | OK<br>OK<br>ON  | In order to verify that CAN BUS 30 is able to reset a protection |
| 3A-3-A.88               | Set the CAN BUS board address to 30  |   |      | 30                              | 30              | 30              |  |
| 3A-3-A.89               | Select "CAN BUS I/F Side" to A   |   |      | A                               | A               | A               |  |
| 3A-3-A.90               | Set OFF in the window All Outlets ON/OFF and push the relative "W" command   |   |      | OK                              | OK              | OK              |  |
| 3A-3-A.91               | Click on Read All command in Digital Readout column  |   |      | OK                              | OK              | OK              |  |
| 3A-3-A.92               | Verify the status of the following flags:<br>BOARD STATUS<br>OVT Alarm<br>From O_1 Status: TPDO to O_8 Status: CAB_N |   |      | OK<br>OK<br>OFF                 | OK<br>OK<br>OFF | OK<br>OK<br>OFF |  |
| 3A-3-A.93               | Set ON in All outlets ON/OFF command and push on the relative "W" command  |   |      | OK                              | OK              | OK              |  |
| 3A-3-A.94               | Click on Read All command in Digital Readout column  |   |      | OK                              | OK              | OK              |  |
| 3A-3-A.95               | Verify the status of the following flags:<br>BOARD STATUS<br>OVT Alarm<br>From O_1 Status: TPDO to O_8 Status: CAB_N |   |      | OK<br>OK<br>ON                  | OK<br>OK<br>ON  | OK<br>OK<br>ON  |  |
| 3A-3-A.96               | Set OFF in the window All Outlets ON/OFF and push the relative "W" command   |   |      | OK                              | OK              | OK              |  |

DATE: 11.06.09 TEST CONDUCTOR *Giovanni* QA *MA*

CUSTOMER *MA*

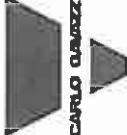
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|---|--|---|------|--|---|--|--|
| AMS02-PDS PFM FULL FUNCTIONAL TEST REPORT   |  | AMS02 POWER DISTRIBUTION SYSTEM                       |      | TEST PROCEDURE REFERENCE                                 |   | TEST REPORT REFERENCE                                    |  |
| UUT DATA :  | Model PFM  | Item  | C.I. | PDS 18   | S/N   | FM01   |  |
| STEP n°   | TEST SEQUENCE  |   |      | EXPECTED VALUE   | MEASURED VALUE  | REMARKS  |  |
| <b>10.3.1.5.8.3 ESEM 3A-3 OUT 3 CURRENT LIMITERS</b>  |  |   |      | OK   | OK  | OK   |  |
| 3A-3-A.97   | Click on Read All command in Digital Readout column<br>Verify the status of the following flags:   |   |      | OK   | OK  | OK   |  |
| 3A-3-A.98   | BOARD STATUS<br>OVT Alarm<br>From O_1 CMD: TPD0 to O_8 CMD: CAB_N<br>From O_1 Status: TPD0 to O_8 Status: CAB_N  |   |      | OK<br>OK<br>OFF<br>OFF                                   | OK<br>OK<br>OFF<br>OFF  | OK<br>OK<br>OFF<br>OFF                                   |  |
| 3A-3-A.99   | Disconnect outlet cables   |   |      | OK   | OK  | OK   |  |
| 3A-3-A.100  | Connect outlet cables to short circuit simulator without amperometer   |   |      | OK   | OK  | OK   |  |
| 3A-3-A.101  | Set short circuit simulator to 3ms   |   |      | OK   | OK  | OK   |  |
| 3A-3-A.102  | Set ON in All outlets ON/OFF command and push on the relative "W" command  |   |      | OK   | OK  | OK   |  |
| 3A-3-A.103  | Click on Read all in Digital readout column and verify from outlet status located in Digital readout column<br>that all outlets are on                           |   |      | OK   | OK  | OK   |  |
| 3A-3-A.104  | Create short circuit pressing start button on short circuit simulator  |   |      | OK   | OK  | OK   |  |
| 3A-3-A.105  | Verify the status of the following flags:<br>BOARD STATUS  |   |      | OK   | OK  | OK   |  |
| 3A-3-A.106  | Click on Read all in Digital readout column and verify from outlet status located in Digital readout column<br>that all outlets are on                           |   |      | OK   | OK  | OK   |  |
| 3A-3-A.107  | Set short circuit simulator to 10ms short circuit duration   |   |      | OK   | OK  | OK   |  |
| 3A-3-A.108  | Monitor the short circuit current with a current probe (Ch1 of oscilloscope)<br>Monitor the 28V of a different outlet of Esem3A under test (Ch2 of oscilloscope) |   |      | OK   | OK  | OK   |  |
| 3A-3-A.109  | Create the short circuit pressing start button on short circuit simulator  |   |      | OK   | OK  | OK   |  |
| 3A-3-A.110  | Make an hardcopy of the oscilloscope measurements  |   |      | OK   | OK  | OK   | Add Annex 19 in the end of document  |
| 3A-3-A.111  | Measure in the previous picture the current limitation value   |   |      | 6,50A±10%  | 6,36A   | 6,36A  |  |
| 3A-3-A.112  | Measure in previous picture the current limitation time  |   |      | 5ms<T lim<6ms  | 5,11ms  | 5,11ms   |  |
| 3A-3-A.113  | Verify with multimeter the absence of output voltage across load 3   |   |      | 0,00V±1,00V  | 0,00V   | 0,00V  |  |
| 3A-3-A.114  | Click on Read All command in Digital Readout column  |   |      | OK   | OK  | OK   |  |
| Verify the status of the following flags:<br>BOARD STATUS   |  |   |      | NOK  | OK  | OK   |  |
| 3A-3-A.115  | OVT Alarm<br>O_1 Status: TPD0<br>O_2 Status: TPD4<br>O_3 Status: ERO_N<br>O_4 Status: MPD_R<br>O_5 Status: SPD3_R<br>O_6 Status: UGPD_R                          |   |      | ON<br>ON<br>ON<br>OFF<br>ON<br>ON<br>ON                  | ON<br>ON<br>ON<br>OFF<br>ON<br>ON<br>ON   | ON<br>ON<br>ON<br>OFF<br>ON<br>ON<br>ON                  |  |
| DATE: 11.06.04  | TEST CONDUCTOR <i>GF 2010</i>  |   | QA   | <i>1/2</i>   |   | CUSTOMER   |  |

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|--|--|-----------|------|--|---|--|--|
| UUT DATA :                                 | Model  | PFM       | Item | AMS02 POWER DISTRIBUTION SYSTEM                          | C.I.  | TEST PROCEDURE REFERENCE                                 | TEST REPORT REFERENCE  |
| STEP n°                                    | TEST SEQUENCE  |           |      |  | EXPECTED VALUE                                    | MEASURED VALUE   | REMARKS  |
| 3A-3-A.116                                 | O_7 Status: SPD2_R<br>O_8 Status: CAB_N                                    |           |      |  | ON<br>ON  | ON<br>ON   | ON<br>ON   |
| 3A-3-A.117                                 | Set the CAN BUS board address to 31  |           |      |  | 31  | 31   |  |
| 3A-3-A.118                                 | Select "CAN BUS I/F Side" to B   |           |      |  | B   | B  |  |
| 3A-3-A.119                                 | Click on Read All command in Digital Readout column                        |           |      |  | OK  | OK   | OK   |
| Verify the status of the following flags:  |  |           |      |  |   |  |  |
| BOARD STATUS                               |  |           |      |  |   |  |  |
| OVT Alarm                                  |  |           |      |  |   |  |  |
| O_1 Status: TPDO                           |  |           |      |  |   |  |  |
| O_2 Status: TPD4                           |  |           |      |  |   |  |  |
| O_3 Status: ERO_N                          |  |           |      |  |   |  |  |
| O_4 Status: MPD_R                          |  |           |      |  |   |  |  |
| O_5 Status: SPD3_R                         |  |           |      |  |   |  |  |
| O_6 Status: UGPD_R                         |  |           |      |  |   |  |  |
| O_7 Status: SPD2_R                         |  |           |      |  |   |  |  |
| O_8 Status: CAB_N                          |  |           |      |  |   |  |  |
| 3A-3-A.120                                 | Set OFF in the window All Outlets ON/OFF and push the relative "W" command |           |      |  | OK  | OK   | OK   |
| 3A-3-A.121                                 | Disconnect the short circuit simulator from outlet cables                  |           |      |  | OK  | OK   | OK   |
| 3A-3-A.122                                 | Disconnect current probe   |           |      |  | OK  | OK   | OK   |
| 3A-3-A.123                                 | Connect outlet cables to active load                                       |           |      |  | OK  | OK   | OK   |
| 3A-3-A.124                                 | Set ON in All outlets ON/OFF command and push on the relative "W" command  |           |      |  | OK  | OK   | OK   |
| Verify the status of the following flags:  |  |           |      |  |   |  |  |
| BOARD STATUS                               |  |           |      |  |   |  |  |
| OVT Alarm                                  |  |           |      |  |   |  |  |
| From O_1 Status: TPDO to O_8 Status: CAB_N |  |           |      |  |   |  |  |
| 3A-3-A.125                                 | Set the CAN BUS board address to 30  |           |      |  | OK<br>OK<br>ON                                    | OK<br>OK<br>ON   | OK<br>OK<br>ON   |
| 3A-3-A.126                                 | Set the CAN BUS board address to 30  |           |      |  | 30  | 30   | In order to verify that CAN BUS 30 is able to reset a protection |
| 3A-3-A.127                                 | Select "CAN BUS I/F Side" to A   |           |      |  | A   | A  |  |
| 3A-3-A.128                                 | Set OFF in the window All Outlets ON/OFF and push the relative "W" command |           |      |  | OK  | OK   |  |
| 3A-3-A.129                                 | Click on Read All command in Digital Readout column                        |           |      |  | OK  | OK   |  |
| Verify the status of the following flags:  |  |           |      |  |   |  |  |
| BOARD STATUS                               |  |           |      |  |   |  |  |
| OVT Alarm                                  |  |           |      |  |   |  |  |
| From O_1 Status: TPDO to O_8 Status: CAB_N |  |           |      |  |   |  |  |
| 3A-3-A.131                                 | Set ON in All outlets ON/OFF command and push on the relative "W" command  |           |      |  | OK  | OK   |  |
| 3A-3-A.132                                 | Click on Read All command in Digital Readout column                        |           |      |  | OK  | OK   |  |
| 3A-3-A.133                                 | Verify the status of the following flags:                                  |           |      |  | OK  | OK   |  |
| DATE: 11.06.09                             | TEST CONDUCTOR   | QA        |      |  |   |  | CUSTOMER   |

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|  <b>AMSO2-PDS</b><br><b>CARLO GAVAZZI SPACE SpA</b> |  | <b>PDS-PR-CGS-006</b><br><b>Doc N°:</b> 2 <b>Data:</b> 10/06/2009<br><b>Ediz.:</b> 1 <b>Date:</b> 27/06/2009<br><b>Issue:</b> Pagina 106 di 370<br><b>Page:</b> Pagina 106 di 370 |   |
|--|--|---|---|
| <b>UUT DATA :</b> AMS02-PDS PFM FULL FUNCTIONAL TEST REPORT  |  | <b>TEST PROCEDURE REFERENCE</b><br><b>S/N:</b> FM01 <b>TEST REPORT REFERENCE:</b>   |   |
| STEP n°  | Model  | Item  | UUT DATA : AMS02 POWER DISTRIBUTION SYSTEM C.I. PDS 18 S/N FM01 |
| STEP n°  | TEST SEQUENCE  |   | EXPECTED VALUE MEASURED VALUE REMARKS                           |
| 3A-3-A.134   | BOARD STATUS<br>OVT Alarm<br>From O_1 Status: TPDD0 to O_8 Status: CAB_N<br>Set OFF in the window All Outlets ON/OFF and push the relative "W" command |   | OK OK ON OK<br>OK OK ON OK<br>OK OK ON OK                       |

#### 10.3.1.5.8.4 ESEM 3A-3 OUT 4 CURRENT LIMITERS

|             |  |                        |                                     |
|-------------|--|------------------------|-------------------------------------|
| 3A-3-A.135  | Click on Read All command in Digital Readout column  | OK                     | OK                                  |
|             | Verify the status of the following flags:<br><b>BOARD STATUS</b>   | OK<br>OK<br>OFF<br>OFF | OK<br>OK<br>OFF<br>OFF              |
| 3A-3-A.136  | OVT Alarm<br>From O_1 CMD: TPDD0 to O_8 CMD: CAB_N<br>From O_1 Status: TPDD0 to O_8 Status: CAB_N  | OK<br>OK<br>OK         | OK<br>OK<br>OK                      |
| 3A-3-A.137  | Disconnect outlet cables   | OK                     | OK                                  |
| 3A-3-A.138  | Connect outlet cables to short circuit simulator without amperometer   | OK                     | OK                                  |
| 3A-3-A.139  | Set short circuit simulator to 3ms   | OK                     | OK                                  |
| 3A-3-A.140  | Set ON in All outlets, ON/OFF command and push on the relative "W" command   | OK                     | OK                                  |
| 3A-3-A.141  | Click on Read all in Digital readout column and verify from outlet status located in Digital readout column<br>that all outlets are on                           | OK                     | OK                                  |
| 3A-3-A.142  | Create short circuit pressing start button on short circuit simulator  | OK                     | OK                                  |
| 3A-3-A.143  | Verify the status of the following flags:<br><b>BOARD STATUS</b>   | OK                     | OK                                  |
| 3A-3-A.144  | Click on Read all in Digital readout column and verify from outlet status located in Digital readout column<br>that all outlets are on                           | OK                     | OK                                  |
| 3A-3-A.145  | Set short circuit simulator to 10ms short circuit duration   | OK                     | OK                                  |
| 3A-3-A.146  | Monitor the short circuit current with a current probe (Ch1 of oscilloscope)<br>Monitor the 28V of a different outlet of Esem3A under test (Ch2 of oscilloscope) | OK                     | OK                                  |
| 3A-3-A.147  | Create the short circuit pressing start button on short circuit simulator  | OK                     | OK                                  |
| 3A-3-A.148  | Make an hardcopy of the oscilloscope measurements  | OK                     | Add Annex 20 in the end of document |
| 3A-3-A.149  | Measure in the previous picture the current limitation value   | 6.50±10%               | 6.26A                               |
| 3A-3-A.150  | Measure in previous picture the current limitation value   | 5ms<T lim<6ms          | 5.09ms                              |
| 3A-3-A.151  | Verify with multimeter the absence of output voltage across load 4   | 0.00V±1.00V            | 0.00V                               |
| 3A-3-A.152  | Click on Read All command in Digital Readout column<br>Verify the status of the following flags:<br><b>BOARD STATUS</b>  | OK                     | OK                                  |
| 3A-3-A.153  | OVT Alarm  | NOK<br>OK              | NOK<br>OK                           |
| DATE: 06.09 | TEST CONDUCTOR 09/2010   | QA                     | CUSTOMER                            |

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|---|----------------|---|------|--|---|--|--|
| CARLO GAVAZZI SPACE SpA   |                | AMS02-PDS PFM FULL FUNCTIONAL TEST REPORT |      | TEST PROCEDURE REFERENCE               |   | TEST REPORT REFERENCE  |  |
| UUT DATA :  | Model          | PFM                                       | Item | AMS02 POWER DISTRIBUTION SYSTEM        | C.I.  | PDS 18   | S/N  |
| STEP n°   | TEST SEQUENCE  |   |      |  | EXPECTED<br>VALUE   | MEASURED<br>VALUE  | REMARKS  |
| O_1 Status: TPDO  |                |   |      |  | ON  | ON   | ON   |
| O_2 Status: TPDA  |                |   |      |  | ON  | ON   | ON   |
| O_3 Status: ERO_N   |                |   |      |  | ON  | OFF  | OFF  |
| O_4 Status: MPD_R   |                |   |      |  | ON  | ON   | ON   |
| O_5 Status: SPD3_R  |                |   |      |  | ON  | ON   | ON   |
| O_6 Status: UGPD_R  |                |   |      |  | ON  | ON   | ON   |
| O_7 Status: SPD2_R  |                |   |      |  | ON  | ON   | ON   |
| O_8 Status: CAB_N   |                |   |      |  | ON  | ON   | ON   |
| 3A-3-A.154 Set the CAN BUS board address to 31  |                |   |      |  | 31  | 31   | 31   |
| 3A-3-A.155 Select "CAN BUS I/F Side" to B   |                |   |      |  | B   | B  | B  |
| 3A-3-A.156 Click on Read All command in Digital Readout column                        |                |   |      |  | OK  | OK   | OK   |
| Verify the status of the following flags:   |                |   |      |  |   |  |  |
| BOARD STATUS  |                |   |      |  |   |  |  |
| OVT Alarm   |                |   |      |  | NOK   | NOK  | NOK  |
| O_1 Status: TPDO  |                |   |      |  | OK  | OK   | OK   |
| O_2 Status: TPDA  |                |   |      |  | ON  | ON   | ON   |
| O_3 Status: ERO_N   |                |   |      |  | ON  | ON   | ON   |
| O_4 Status: MPD_R   |                |   |      |  | OFF   | OFF  | OFF  |
| O_5 Status: SPD3_R  |                |   |      |  | ON  | ON   | ON   |
| O_6 Status: UGPD_R  |                |   |      |  | ON  | ON   | ON   |
| O_7 Status: SPD2_R  |                |   |      |  | ON  | ON   | ON   |
| O_8 Status: CAB_N   |                |   |      |  | ON  | ON   | ON   |
| 3A-3-A.158 Set OFF in the window All Outlets ON/OFF and push the relative "W" command |                |   |      |  | OK  | OK   | OK   |
| 3A-3-A.159 Disconnect the short circuit simulator from outlet cables                  |                |   |      |  | OK  | OK   | OK   |
| 3A-3-A.160 Disconnect current probe   |                |   |      |  | OK  | OK   | OK   |
| 3A-3-A.161 Connect outlet cables to active load                                       |                |   |      |  | OK  | OK   | OK   |
| 3A-3-A.162 Set ON in All outlets ON/OFF command and push the relative "W" command     |                |   |      |  | OK  | OK   | OK   |
| Verify the status of the following flags:   |                |   |      |  |   |  |  |
| BOARD STATUS  |                |   |      |  |   |  |  |
| OVT Alarm   |                |   |      |  | OK  | OK   | OK   |
| From O_1 Status: TPDO to O_8 Status: CAB_N  |                |   |      |  | ON  | ON   | ON   |
| 3A-3-A.164 Set the CAN BUS board address to 30  |                |   |      |  | 30  | 30   | In order to verify that CAN BUS 30 is able to reset a protection |
| 3A-3-A.165 Select "CAN BUS I/F Side" to A   |                |   |      |  | A   | A  |  |
| 3A-3-A.166 Set OFF in the window All Outlets ON/OFF and push the relative "W" command |                |   |      |  | OK  | OK   |  |
| 3A-3-A.167 Click on Read All command in Digital Readout column                        |                |   |      |  | OK  | OK   |  |
| 3A-3-A.168 Verify the status of the following flags:                                  |                |   |      |  |   |  |  |
| DATE: 11.06.09  | TEST CONDUCTOR | QA  |      |  |   |  | CUSTOMER   |

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|-------------------------|--|---|------|--|---|--|---|
| CARLO GAVAZZI SPACE SpA |  | AMS02-PDS PFM FULL FUNCTIONAL TEST REPORT |      | Pagina<br>Page                         | 108<br>di<br>370                                    | Pagina<br>Page                         | 108<br>di<br>370                                    |
| UUT DATA :              | Model  | PFM                                       | Item | AMS02 POWER DISTRIBUTION SYSTEM        | C.I.  | TEST PROCEDURE REFERENCE               | TEST REPORT REFERENCE                               |
| STEP n°                 | TEST SEQUENCE  |   |      |  |   | S/N                                    | FM01  |
|                         | BOARD STATUS   |   |      |  |   | EXPECTED<br>VALUE                      | MEASURED<br>VALUE                                   |
|                         | OVT Alarm  |   |      |  |   | OK                                     | OK  |
|                         | From O_1 Status: TPDO to O_8 Status: CAB_N                                 |   |      |  |   | OK                                     | OK  |
| 3A-3-A.169              | Set ON in All outlets ON/OFF command and push on the relative "W" command  |   |      |  |   | OFF                                    | OFF   |
| 3A-3-A.170              | Click on Read All command in Digital Readout column                        |   |      |  |   | OK                                     | OK  |
|                         | Verify the status of the following flags:                                  |   |      |  |   | OK                                     | OK  |
| 3A-3-A.171              | BOARD STATUS   |   |      |  |   | OK                                     | OK  |
|                         | OVT Alarm  |   |      |  |   | OK                                     | OK  |
|                         | From O_1 Status: TPDO to O_8 Status: CAB_N                                 |   |      |  |   | ON                                     | ON  |
| 3A-3-A.172              | Set OFF in the window All Outlets ON/OFF and push the relative "W" command |   |      |  |   | OK                                     | OK  |

### 10.3.1.5.8.5 ESEM 3A-3 OUT 5 CURRENT LIMITERS

|                |   |    |  |  |  |             |                        |
|----------------|---|----|--|--|--|-------------|------------------------|
| 3A-3-A.173     | Click on Read All command in Digital Readout column   |    |  |  |  | OK          | OK                     |
|                | Verify the status of the following flags:   |    |  |  |  | OK          | OK                     |
| 3A-3-A.174     | BOARD STATUS  |    |  |  |  | OK          | OK                     |
|                | OVT Alarm   |    |  |  |  | OFF         | OFF                    |
|                | From O_1 CMD: TPDO to O_8 CMD: CAB_N  |    |  |  |  | OFF         | OFF                    |
|                | From O_1 Status: TPDO to O_8 Status: CAB_N  |    |  |  |  | OFF         | OFF                    |
| 3A-3-A.175     | Disconnect outlet cables  |    |  |  |  | OK          | OK                     |
| 3A-3-A.176     | Connect outlet cables to short circuit simulator without ammeter  |    |  |  |  | OK          | OK                     |
| 3A-3-A.177     | Set short circuit simulator to 3ms  |    |  |  |  | OK          | OK                     |
| 3A-3-A.178     | Set ON in All outlets ON/OFF command and push on the relative "W" command   |    |  |  |  | OK          | OK                     |
| 3A-3-A.179     | Click on Read all in Digital readout column and verify from outlet status located in Digital readout column that all outlets are on |    |  |  |  | OK          | OK                     |
| 3A-3-A.180     | Create short circuit pressing start button on short circuit simulator   |    |  |  |  | OK          | OK                     |
| 3A-3-A.181     | Verify the status of the following flags:   |    |  |  |  | OK          | OK                     |
| 3A-3-A.182     | Click on Read all in Digital readout column and verify from outlet status located in Digital readout column that all outlets are on |    |  |  |  | OK          | OK                     |
| 3A-3-A.183     | Set short circuit simulator to 10ms short circuit duration  |    |  |  |  | OK          | OK                     |
| 3A-3-A.184     | Monitor the short circuit current with a current probe (Ch1 of oscilloscope)  |    |  |  |  | OK          | OK                     |
| 3A-3-A.185     | Monitor the 28V of a different outlet of Esem3A under test (Ch2 of oscilloscope)  |    |  |  |  | OK          | OK                     |
| 3A-3-A.186     | Create the short circuit pressing start button on short circuit simulator   |    |  |  |  | OK          | OK                     |
| 3A-3-A.187     | Make an hardcopy of the oscilloscope measurements   |    |  |  |  | Add Annex 2 | in the end of document |
|                | Measure in the previous picture the current limitation value  |    |  |  |  | 6,50±10%    | 6,44A                  |
| DATE: 12.06.09 | TEST CONDUCTOR  | QA |  |  |  |             | CUSTOMER               |

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| AMS02-PDS  |  | PDS-PR-CGS-006                       |                | PDS-RP-CGS-072 |         |
|------------|--|--------------------------------------|----------------|----------------|---------|
| UUT DATA : | Model PFM  | Item AMS02 POWER DISTRIBUTION SYSTEM | C.I. PDS 18    | S/N            | FW01    |
| STEP n°    | TEST SEQUENCE  |                                      | EXPECTED VALUE | MEASURED VALUE | REMARKS |
| 3A-3-A.188 | Measure in previous picture the current limitation time                    |                                      | 5ms<I_lim<6ms  | 5,12ms         |         |
| 3A-3-A.189 | Verify with multimeter the absence of output voltage across load 5         |                                      | 0,00V±1,00V    | 0,00V          |         |
| 3A-3-A.190 | Click on Read All command in Digital Readout column                        |                                      | OK             | OK             |         |
|            | Verify the status of the following flags:                                  |                                      |                |                |         |
| 3A-3-A.191 | BOARD STATUS   |                                      | NOK            | NOK            |         |
|            | OVT Alarm  |                                      | OK             | OK             |         |
|            | O_1 Status: TPDO   |                                      | ON             | ON             |         |
|            | O_2 Status: TPD4   |                                      | ON             | ON             |         |
|            | O_3 Status: ERO_N  |                                      | ON             | ON             |         |
|            | O_4 Status: MPD_R  |                                      | ON             | ON             |         |
|            | O_5 Status: SPD3_R   |                                      | ON             | ON             |         |
|            | O_6 Status: UGPD_R   |                                      | OFF            | OFF            |         |
|            | O_7 Status: SPD2_R   |                                      | ON             | ON             |         |
|            | O_8 Status: CAB_N  |                                      | ON             | ON             |         |
| 3A-3-A.192 | Set the CAN BUS board address to 31  |                                      | 31             | 31             |         |
| 3A-3-A.193 | Select "CAN BUS I/F Side" to B   |                                      | B              | B              |         |
| 3A-3-A.194 | Click on Read All command in Digital Readout column                        |                                      | OK             | OK             |         |
|            | Verify the status of the following flags:                                  |                                      |                |                |         |
| 3A-3-A.195 | BOARD STATUS   |                                      | NOK            | NOK            |         |
|            | OVT Alarm  |                                      | OK             | OK             |         |
|            | O_1 Status: TPDO   |                                      | ON             | ON             |         |
|            | O_2 Status: TPD4   |                                      | ON             | ON             |         |
|            | O_3 Status: ERO_N  |                                      | ON             | ON             |         |
|            | O_4 Status: MPD_R  |                                      | ON             | ON             |         |
|            | O_5 Status: SPD3_R   |                                      | ON             | ON             |         |
|            | O_6 Status: UGPD_R   |                                      | OFF            | OFF            |         |
|            | O_7 Status: SPD2_R   |                                      | ON             | ON             |         |
|            | O_8 Status: CAB_N  |                                      | ON             | ON             |         |
| 3A-3-A.196 | Set OFF in the window All Outlets ON/OFF and push the relative "W" command |                                      | OK             | OK             |         |
| 3A-3-A.197 | Disconnect the short circuit simulator from outlet cables                  |                                      | OK             | OK             |         |
| 3A-3-A.198 | Disconnect current probe   |                                      | OK             | OK             |         |
| 3A-3-A.199 | Connect outlet cables to active load                                       |                                      | OK             | OK             |         |
| 3A-3-A.200 | Set ON in All outlets ON/OFF command and push on the relative "W" command  |                                      | OK             | OK             |         |
|            | Verify the status of the following flags:                                  |                                      |                |                |         |
| 3A-3-A.201 | BOARD STATUS   |                                      | OK             | OK             |         |
|            | OVT Alarm<br>From O_1 Status: TPDO to O_8 Status: CAB_N                    |                                      | ON             | ON             |         |

DATE: 11.06.09 TEST CONDUCTOR *Pietro* QA *Pietro*

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| CARLO GAVAZZI  |  | AMS02-PDS      |                   | N° Doc:<br>Doc N°:<br>Ediz.:<br>Issue:<br>Pagina<br>Page | PDS-PR-CGS-006<br>2<br>Data:<br>Date:<br>110<br>di<br>370                           | N° Doc:<br>Doc N°:<br>Ediz.:<br>Issue:<br>Pagina<br>Page | PDS-RP-CGS-072<br>1<br>Data:<br>Date:<br>110<br>di<br>370        |
|--|--|----------------|-------------------|--|---|--|--|
| UUT DATA :   | Model  | PFM            | Item              | AMS02 POWER DISTRIBUTION SYSTEM                          | C.I.  | TEST PROCEDURE REFERENCE                                 | TEST REPORT REFERENCE  |
| STEP n°  | TEST SEQUENCE  |                |                   |  | EXPECTED<br>VALUE   | MEASURED<br>VALUE  | REMARKS  |
| 3A-3-A.202   | Set the CAN BUS board address to 30  |                |                   |  | 30  | 30   | In order to verify that CAN BUS 30 is able to reset a protection |
| 3A-3-A.203   | Select "CAN BUS I/F Side" to A   |                |                   |  | A   | A  |  |
| 3A-3-A.204   | Set OFF in the window All Outlets ON/OFF and push the relative "W" command   |                |                   |  | OK  | OK   |  |
| 3A-3-A.205   | Click on Read All command in Digital Readout column  |                |                   |  | OK  | OK   |  |
| 3A-3-A.206   | Verify the status of the following flags:<br><br>BOARD STATUS<br>From O_1 Status: TPDO to O_8 Status: CAB_N  |                |                   |  | OK<br>OK<br>OFF   | OK<br>OK<br>OFF  |  |
| 3A-3-A.207   | Set ON in All outlets ON/OFF command and push on the relative "W" command  |                |                   |  | OK  | OK   |  |
| 3A-3-A.208   | Click on Read All command in Digital Readout column  |                |                   |  | OK  | OK   |  |
| 3A-3-A.209   | Verify the status of the following flags:<br><br>BOARD STATUS<br>From O_1 Status: TPDO to O_8 Status: CAB_N  |                |                   |  | OK<br>OK<br>ON  | OK<br>OK<br>ON   |  |
| 3A-3-A.210   | Set OFF in the window All Outlets ON/OFF and push the relative "W" command   |                |                   |  | OK  | OK   |  |
| <b>10.3.1.5.8.6 ESEM 3A-3 OUT 6 CURRENT LIMITERS</b> |  |                |                   |  |   |  |  |
| 3A-3-A.211   | Click on Read All command in Digital Readout column  |                |                   |  | OK  | OK   |  |
|  | Verify the status of the following flags:<br><br>BOARD STATUS<br>From O_1 Status: TPDO to O_8 CMD: CAB_N   |                |                   |  | OK<br>OK<br>OFF   | OK<br>OK<br>OFF  |  |
| 3A-3-A.212   | OVT Alarm<br>From O_1 CMD: TPDO to O_8 Status: CAB_N   |                |                   |  | OK<br>OK<br>OFF   | OK<br>OK<br>OFF  |  |
| 3A-3-A.213   | Disconnect outlet cables   |                |                   |  | OK  | OK   |  |
| 3A-3-A.214   | Connect outlet cables to short circuit simulator without ammeter   |                |                   |  | OK  | OK   |  |
| 3A-3-A.215   | Set short circuit simulator to 3ms   |                |                   |  | OK  | OK   |  |
| 3A-3-A.216   | Set ON in All outlets ON/OFF command and push on the relative "W" command  |                |                   |  | OK  | OK   |  |
| 3A-3-A.217   | Click on Read all in Digital readout column and verify from outlet status located in Digital readout column that all outlets are on  |                |                   |  | OK  | OK   |  |
| 3A-3-A.218   | Create short circuit pressing start button on short circuit simulator  |                |                   |  | OK  | OK   |  |
| 3A-3-A.219   | Verify the status of the following flags:<br><br>BOARD STATUS<br>Click on Read all in Digital readout column and verify from outlet status located in Digital readout column that all outlets are on |                |                   |  | OK  | OK   |  |
| DATE:  | 11.06.09   | TEST CONDUCTOR | Francesco Zerbini | QA   |  | CUSTOMER   |  |

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|-------------------------|--|---|------|--|------|---|---|--|----------|---|-------------------------------------|
| CARLO GAVAZZI SPACE SpA |  | AMS02-PDS PFM FULL FUNCTIONAL TEST REPORT |      | TEST PROCEDURE REFERENCE               |      | TEST REPORT REFERENCE   |   |  |          |   |                                     |
| UUT DATA :              | Model  | PFM                                       | Item | AMS02 POWER DISTRIBUTION SYSTEM        | C.I. | PDS 18  | S/N   | FM01                                   |          |   |                                     |
| STEP n°                 | TEST SEQUENCE  |   |      |  |      | EXPECTED<br>VALUE   | MEASURED<br>VALUE   |  | REMARKS  |   |                                     |
| 3A-3-A.221              | Set short circuit simulator to 10ms short circuit duration                       |   |      |  |      | OK  | OK  |  | OK       |   |                                     |
| 3A-3-A.222              | Monitor the short circuit current with a current probe (Ch1 of oscilloscope)     |   |      |  |      | OK  | OK  |  | OK       |   |                                     |
| 3A-3-A.223              | Monitor the 28V of a different outlet of Esem3A under test (Ch2 of oscilloscope) |   |      |  |      | OK  | OK  |  | OK       |   |                                     |
| 3A-3-A.224              | Create the short circuit pressing start button on short circuit simulator        |   |      |  |      | OK  | OK  |  | OK       |   | Add Annex 22 in the end of document |
| 3A-3-A.225              | Make an hardcopy of the oscilloscope measurements                                |   |      |  |      | 6,50A±10%   | 6,44A   |  |          |   |                                     |
| 3A-3-A.226              | Measure in the previous picture the current limitation value                     |   |      |  |      | 5ms<T_lim<6ms   | 5,25ms  |  |          |   |                                     |
| 3A-3-A.227              | Measure in previous picture the current limitation time                          |   |      |  |      | 0,00V±1,00V   | 0,00V   |  |          |   |                                     |
| 3A-3-A.228              | Verify with multimeter the absence of output voltage across load 6               |   |      |  |      | OK  | OK  |  | OK       |   |                                     |
|                         | Verify the status of the following flags:  |   |      |  |      |   |   |  |          |   |                                     |
|                         | BOARD STATUS   |   |      |  |      |   |   |  |          |   |                                     |
|                         | OVT Alarm  |   |      |  |      | NOK   | NOK   |  | NOK      |   |                                     |
|                         | O_1 Status:  | TPDO                                      |      |  |      | OK  | OK  |  | OK       |   |                                     |
|                         | O_2 Status:  | TPD4                                      |      |  |      | ON  | ON  |  | ON       |   |                                     |
|                         | O_3 Status:  | ER0_N                                     |      |  |      | ON  | ON  |  | ON       |   |                                     |
|                         | O_4 Status:  | MPD_R                                     |      |  |      | ON  | ON  |  | ON       |   |                                     |
|                         | O_5 Status:  | SPD3_R                                    |      |  |      | ON  | ON  |  | ON       |   |                                     |
|                         | O_6 Status:  | UGPD_R                                    |      |  |      | OFF   | OFF   |  | OFF      |   |                                     |
|                         | O_7 Status:  | SPD2_R                                    |      |  |      | ON  | ON  |  | ON       |   |                                     |
|                         | O_8 Status:  | CAB_N                                     |      |  |      | ON  | ON  |  | ON       |   |                                     |
| 3A-3-A.230              | Set the CAN BUS board address to 31  |   |      |  |      | 31  | 31  |  |          |   |                                     |
| 3A-3-A.231              | Select "CAN BUS I/F Side" to B   |   |      |  |      | B   | B   |  |          |   |                                     |
| 3A-3-A.232              | Click on Read All command in Digital Readout column                              |   |      |  |      | OK  | OK  |  | OK       |   |                                     |
|                         | Verify the status of the following flags:  |   |      |  |      |   |   |  |          |   |                                     |
|                         | BOARD STATUS   |   |      |  |      |   |   |  |          |   |                                     |
|                         | OVT Alarm  |   |      |  |      | NOK   | NOK   |  | NOK      |   |                                     |
|                         | O_1 Status:  | TPDO                                      |      |  |      | OK  | OK  |  | OK       |   |                                     |
|                         | O_2 Status:  | TPD4                                      |      |  |      | ON  | ON  |  | ON       |   |                                     |
|                         | O_3 Status:  | ER0_N                                     |      |  |      | ON  | ON  |  | ON       |   |                                     |
|                         | O_4 Status:  | MPD_R                                     |      |  |      | ON  | ON  |  | ON       |   |                                     |
|                         | O_5 Status:  | SPD3_R                                    |      |  |      | ON  | ON  |  | ON       |   |                                     |
|                         | O_6 Status:  | UGPD_R                                    |      |  |      | OFF   | OFF   |  | OFF      |   |                                     |
|                         | O_7 Status:  | SPD2_R                                    |      |  |      | ON  | ON  |  | ON       |   |                                     |
|                         | O_8 Status:  | CAB_N                                     |      |  |      | ON  | ON  |  | ON       |   |                                     |
| 3A-3-A.234              | Set OFF in the window All Outlets ON/OFF and push the relative "W" command       |   |      |  |      | OK  | OK  |  | OK       |   | Protection reset!                   |
| 3A-3-A.235              | Disconnect the short circuit simulator from outlet cables                        |   |      |  |      | OK  | OK  |  | OK       |   |                                     |
| 3A-3-A.236              | Disconnect current probe   |   |      |  |      | OK  | OK  |  | OK       |   |                                     |
| DATE: <b>11.06.09</b>   | TEST CONDUCTOR <b>GF2004</b>   |   |      |  |      | QA  |  |  | CUSTOMER |   |                                     |

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| <b>UUT DATA :</b>   |  | <b>Model</b> <b>PFM</b>   | <b>Item</b> <b>AMS02 POWER DISTRIBUTION SYSTEM</b> | <b>C.I.</b> <b>PDS 18</b>   | <b>TEST PROCEDURE REFERENCE</b>                                  |  |   |  |   |
| <b>STEP n°</b>  | <b>TEST SEQUENCE</b>   |   | <b>EXPECTED VALUE</b>                              | <b>MEASURED VALUE</b>   | <b>REMARKS</b>   |  |   |  |   |
| 3A-3-A.237  | Connect outlet cables to active load                                       |   | OK   | OK  | OK   |  |   |  |   |
| 3A-3-A.238  | Set ON in All outlets ON/OFF command and push on the relative "W" command  |   | OK   | OK  | OK   |  |   |  |   |
|   | Verify the status of the following flags:                                  |   |  |   |  |  |   |  |   |
| 3A-3-A.239  | BOARD STATUS<br>OVT Alarm<br>From O_1 Status: TPD0 to O_8 Status: CAB_N    |   | OK<br>OK<br>ON                                     | OK<br>OK<br>ON  | In order to verify that CAN BUS 30 is able to reset a protection |  |   |  |   |
| 3A-3-A.240  | Set the CAN BUS board address to 30  |   | 30   | 30  | A  |  |   |  |   |
| 3A-3-A.241  | Select "CAN BUS I/F Side" to A   |   |  |   | A  |  |   |  |   |
| 3A-3-A.242  | Set OFF in the window All Outlets ON/OFF and push the relative "W" command |   | OK   | OK  | OK   |  |   |  |   |
| 3A-3-A.243  | Click on Read All command in Digital Readout column                        |   | OK   | OK  | OK   |  |   |  |   |
|   | Verify the status of the following flags:                                  |   |  |   |  |  |   |  |   |
| 3A-3-A.244  | BOARD STATUS<br>OVT Alarm<br>From O_1 Status: TPD0 to O_8 Status: CAB_N    |   | OK<br>OK<br>OFF                                    | OK<br>OK<br>OFF   | OK   |  |   |  |   |
| 3A-3-A.245  | Set ON in All outlets ON/OFF command and push on the relative "W" command  |   | OK   | OK  | OK   |  |   |  |   |
| 3A-3-A.246  | Click on Read All command in Digital Readout column                        |   | OK   | OK  | OK   |  |   |  |   |
|   | Verify the status of the following flags:                                  |   |  |   |  |  |   |  |   |
| 3A-3-A.247  | BOARD STATUS<br>OVT Alarm<br>From O_1 Status: TPD0 to O_8 Status: CAB_N    |   | OK<br>OK<br>ON                                     | OK<br>OK<br>ON  | OK   |  |   |  |   |
| 3A-3-A.248  | Set OFF in the window All Outlets ON/OFF and push the relative "W" command |   | OK   | OK  | OK   |  |   |  |   |
|   |  |   | QA   | <i>9/20/0</i>   | <i>[Signature]</i>   |  |   |  |   |
| DATE: <b>11.06.09</b>   | TEST CONDUCTOR   | QA  | CUSTOMER   |   |  |  |   |  |   |

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| <b>AMS02-PDS PFM FULL FUNCTIONAL TEST REPORT</b>  |   | <b>AMS02 POWER DISTRIBUTION SYSTEM</b>                |                       | <b>TEST PROCEDURE REFERENCE</b>                          |   | <b>TEST REPORT REFERENCE</b>                             |   |
| <b>UUT DATA :</b>   | <b>Model</b>  | <b>PFM</b>  | <b>Item</b>           | <b>C.I.</b>  | <b>PDS 18</b>   | <b>S/N</b>   | <b>FM01</b>   |
| <b>STEP n°</b>  | <b>TEST SEQUENCE</b>  |   | <b>EXPECTED VALUE</b> | <b>MEASURED VALUE</b>                                    | <b>REMARKS</b>  |  |   |
| <b>10.3.1.5.8.7 ESEM 3A-3 OUT 7 CURRENT LIMITERS</b>  |   |   |                       |  |   |  |   |
| 3A-3-A.249  | Click on Read All command in Digital Readout column<br>Verify the status of the following flags:                                    |   | OK                    | OK   | OK  | OK   | OK  |
| 3A-3-A.250  | BOARD STATUS<br>OVT Alarm   |   | OK                    | OK   | OK  | OK   | OK  |
| 3A-3-A.251  | From O_1 CMD: TPDO to O_8 CMD: CAB_N<br>From O_1 Status: TPDO to O_8 Status: CAB_N  |   | OFF                   | OFF  | OFF   | OFF  | OFF   |
| 3A-3-A.252  | Disconnect outlet cables  |   | OK                    | OK   | OK  | OK   | OK  |
| 3A-3-A.253  | Connect outlet cables to short circuit simulator without amperometer  |   | OK                    | OK   | OK  | OK   | OK  |
| 3A-3-A.254  | Set short circuit simulator to 3ms  |   | OK                    | OK   | OK  | OK   | OK  |
| 3A-3-A.255  | Set ON in All outlets ON/OFF command and push on the relative "W" command   |   | OK                    | OK   | OK  | OK   | OK  |
| 3A-3-A.256  | Click on Read all in Digital readout column and verify from outlet status located in Digital readout column that all outlets are on |   | OK                    | OK   | OK  | OK   | OK  |
| 3A-3-A.257  | Create short circuit Pressing start button on short circuit simulator   |   | OK                    | OK   | OK  | OK   | OK  |
| 3A-3-A.258  | Verify the status of the following flags:<br>BOARD STATUS   |   | OK                    | OK   | OK  | OK   | OK  |
| 3A-3-A.259  | Click on Read all in Digital readout column and verify from outlet status located in Digital readout column that all outlets are on |   | OK                    | OK   | OK  | OK   | OK  |
| 3A-3-A.260  | Set short circuit simulator to 10ms short circuit duration  |   | OK                    | OK   | OK  | OK   | OK  |
| 3A-3-A.261  | Monitor the short circuit current with a current probe (Ch1 of oscilloscope)  |   | OK                    | OK   | OK  | OK   | OK  |
| 3A-3-A.262  | Monitor the 28V of a different outlet of Esem3A under test (Ch2 of oscilloscope)  |   | OK                    | OK   | OK  | OK   | OK  |
| 3A-3-A.263  | Create the short circuit pressing start button on short circuit simulator   |   | OK                    | OK   | OK  | OK   | OK  |
| 3A-3-A.264  | Make an hardcopy of the oscilloscope measurements   |   | 6,50A±10%             | 6,40A  | 6,40A   | 5ms<T lim<8ms  | 5,09ms  |
| 3A-3-A.265  | Measure in previous picture the current limitation value  |   | 0,00V±1,00V           | 0,00V  | 0,00V   | 0,00V±1,00V  | 0,00V   |
| 3A-3-A.266  | Verify with multimeter the absence of output voltage across load 7  |   | OK                    | OK   | OK  | OK   | OK  |
| Click on Read All command in Digital Readout column<br><br>Verify the status of the following flags:<br>BOARD STATUS                                  |   |   |                       |  |   |  |   |
| 3A-3-A.267  | OVT Alarm   |   | NOK                   | NOK  | NOK   | OK   | OK  |
| O_1   | Status: TPDO  |   | OK                    | ON   | ON  | ON   | ON  |
| O_2   | Status: TPDI  |   | ON                    | ON   | ON  | ON   | ON  |
| O_3   | Status: ERO_N   |   | ON                    | ON   | ON  | ON   | ON  |
| O_4   | Status: MPD_R   |   | ON                    | ON   | ON  | ON   | ON  |
| O_5   | Status: SPD3_R  |   | ON                    | ON   | ON  | ON   | ON  |
| O_6   | Status: UGPD_R  |   | ON                    | ON   | ON  | ON   | ON  |
| DATE: 11.06.09  | TEST CONDUCTOR <i>GFro/0</i>  |   | QA                    | <i>MF</i>  |   |  |   |
| CUSTOMER  |   |   |                       |  |   |  |   |

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| CARLO GAVAZZI SPACE SpA |  | AMS02-PDS PFM FULL FUNCTIONAL TEST REPORT |      | TEST PROCEDURE REFERENCE                                 |   | TEST REPORT REFERENCE                                    |   |
| UUT DATA :              | Model  | PFM                                       | Item | AMS02 POWER DISTRIBUTION SYSTEM                          | C.I.  | PDS 18   | S/N   |
| STEP n°                 | TEST SEQUENCE  |   |      |  | EXPECTED<br>VALUE   | MEASURED<br>VALUE  | REMARKS   |
|                         | O_7 Status: SPD2_R<br>O_8 Status: CAB_N                                    |   |      |  | OFF<br>ON   | OFF<br>ON  | OFF<br>ON   |
| 3A-3-A.268              | Set the CAN BUS board address to 31  |   |      |  | 31  | 31   |   |
| 3A-3-A.269              | Select "CAN BUS I/F Side" to B   |   |      |  | B   | B  |   |
| 3A-3-A.270              | Click on Read All command in Digital Readout column                        |   |      |  | OK  | OK   |   |
|                         | Verify the status of the following flags:                                  |   |      |  |   |  |   |
|                         | BOARD STATUS   |   |      |  |   |  |   |
|                         | OVT Alarm  |   |      |  |   |  |   |
|                         | O_1 Status: TPDO   |   |      |  |   |  |   |
|                         | O_2 Status: TPDI   |   |      |  |   |  |   |
| 3A-3-A.271              | O_3 Status: ER0_N  |   |      |  |   |  |   |
|                         | O_4 Status: MPD_R  |   |      |  |   |  |   |
|                         | O_5 Status: SPD3_R   |   |      |  |   |  |   |
|                         | O_6 Status: UGPD_R   |   |      |  |   |  |   |
|                         | O_7 Status: SPD2_R   |   |      |  |   |  |   |
|                         | O_8 Status: CAB_N  |   |      |  |   |  |   |
| 3A-3-A.272              | Set OFF in the window All Outlets ON/OFF and push the relative "W" command |   |      |  | OK  | OK   |   |
| 3A-3-A.273              | Disconnect the short circuit simulator from outlet cables                  |   |      |  | OK  | OK   |   |
| 3A-3-A.274              | Disconnect current probe   |   |      |  | OK  | OK   |   |
| 3A-3-A.275              | Connect outlet cables to active load                                       |   |      |  | OK  | OK   |   |
| 3A-3-A.276              | Set ON in All outlets ON/OFF command and push on the relative "W" command  |   |      |  | OK  | OK   |   |
|                         | Verify the status of the following flags:                                  |   |      |  |   |  |   |
|                         | BOARD STATUS   |   |      |  |   |  |   |
|                         | OVT Alarm  |   |      |  |   |  |   |
|                         | From O_1 Status: TPDO to O_8 Status: CAB_N                                 |   |      |  |   |  |   |
| 3A-3-A.278              | Set the CAN BUS board address to 30  |   |      |  | ON  | ON   |   |
| 3A-3-A.279              | Select "CAN BUS I/F Side" to A   |   |      |  | A   | A  |   |
| 3A-3-A.280              | Set OFF in the window All Outlets ON/OFF and push the relative "W" command |   |      |  | OK  | OK   |   |
| 3A-3-A.281              | Click on Read All command in Digital Readout column                        |   |      |  | OK  | OK   |   |
|                         | Verify the status of the following flags:                                  |   |      |  |   |  |   |
|                         | BOARD STATUS   |   |      |  |   |  |   |
|                         | OVT Alarm  |   |      |  |   |  |   |
|                         | From O_1 Status: TPDO to O_8 Status: CAB_N                                 |   |      |  |   |  |   |
| 3A-3-A.283              | Set ON in All outlets ON/OFF command and push on the relative "W" command  |   |      |  |   |  |   |
| 3A-3-A.284              | Click on Read All command in Digital Readout column                        |   |      |  |   |  |   |
| 3A-3-A.285              | Verify the status of the following flags:                                  |   |      |  |   |  |   |
| DATE: 11.06.09          | TEST CONDUCTOR   | QA  |      |  |   |  | CUSTOMER  |

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| CARLO GAVAZZI SPACE SpA |   | AMS02-PDS PFM FULL FUNCTIONAL TEST REPORT |     | Pagina<br>Page                         | 116<br>di<br>370                                    | Pagina<br>Page                                      | 116<br>di<br>370                                    |  |
| UUT DATA :              |   | Model                                     | PFM | Item                                   | AMS02 POWER DISTRIBUTION SYSTEM                     | C.I.  | TEST PROCEDURE REFERENCE                            | TEST REPORT REFERENCE  |
| STEP n°                 | TEST SEQUENCE   |   |     |  |   | S/N   | FM01  |  |
|                         | O_1 Status: TPDO<br>O_2 Status: TPD4<br>O_3 Status: ERO_N<br>O_4 Status: MPD_R<br>O_5 Status: SPD3_R<br>O_6 Status: UGPD_R<br>O_7 Status: SPD2_R<br>O_8 Status: CAB_N |   |     |  |   | ON<br>ON<br>ON<br>ON<br>ON<br>ON<br>ON<br>OFF       | ON<br>ON<br>ON<br>ON<br>ON<br>ON<br>ON<br>OFF       | ON<br>ON<br>ON<br>ON<br>ON<br>ON<br>ON<br>OFF                    |
| 3A-3-A.306              | Set the CAN BUS board address to 31   |   |     |  |   |   |   |  |
| 3A-3-A.307              | Select "CAN BUS I/F Side" to B  |   |     |  |   | 31  | B   | 31   |
| 3A-3-A.308              | Click on Read All command in Digital Readout column   |   |     |  |   | OK  | OK  | OK   |
|                         | Verify the status of the following flags:   |   |     |  |   |   |   |  |
|                         | BOARD STATUS  |   |     |  |   |   |   |  |
|                         | OVT Alarm   |   |     |  |   |   |   |  |
| 3A-3-A.309              | O_1 Status: TPDO<br>O_2 Status: TPD4<br>O_3 Status: ERO_N<br>O_4 Status: MPD_R<br>O_5 Status: SPD3_R<br>O_6 Status: UGPD_R<br>O_7 Status: SPD2_R<br>O_8 Status: CAB_N |   |     |  |   | OK<br>OK<br>ON<br>ON<br>ON<br>ON<br>ON<br>ON<br>OFF | OK<br>OK<br>ON<br>ON<br>ON<br>ON<br>ON<br>ON<br>OFF | NOK<br>OK<br>OK<br>OK<br>OK<br>OK<br>OK<br>OK<br>OK              |
| 3A-3-A.310              | Set OFF in the window All Outlets ON/OFF and push the relative "W" command  |   |     |  |   | OK  | OK  | OK   |
| 3A-3-A.311              | Disconnect the short circuit simulator from outlet cables   |   |     |  |   | OK  | OK  | OK   |
| 3A-3-A.312              | Disconnect current probe  |   |     |  |   | OK  | OK  | OK   |
| 3A-3-A.313              | Connect outlet cables to active load  |   |     |  |   | OK  | OK  | OK   |
| 3A-3-A.314              | Set ON in All outlets ON/OFF command and push on the relative "W" command   |   |     |  |   | OK  | OK  | OK   |
|                         | Verify the status of the following flags:   |   |     |  |   |   |   |  |
| 3A-3-A.315              | BOARD STATUS  |   |     |  |   | OK  | OK  | OK   |
|                         | OVT Alarm   |   |     |  |   | OK  | OK  | OK   |
|                         | From O_1 Status: TPDO to O_8 Status: CAB_N  |   |     |  |   | ON  | ON  | ON   |
| 3A-3-A.316              | Set the CAN BUS board address to 30   |   |     |  |   | 30  | 30  | In order to verify that CAN BUS 30 is able to reset a protection |
| 3A-3-A.317              | Select "CAN BUS I/F Side" to A  |   |     |  |   | A   | A   |  |
| 3A-3-A.318              | Set OFF in the window All Outlets ON/OFF and push the relative "W" command  |   |     |  |   | OK  | OK  |  |
| 3A-3-A.319              | Click on Read All command in Digital Readout column   |   |     |  |   | OK  | OK  |  |
| 3A-3-A.320              | Verify the status of the following flags:   |   |     |  |   |   |   |  |
| DATE: 17.06.09          | TEST CONDUCTOR  | QA  |     |  |   |   |   | CUSTOMER   |

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|  <p><b>CARLO GAVAZZI</b></p> <p><b>AMS02-PDS</b></p> <p>AMS02-PDS PFM FULL FUNCTIONAL TEST REPORT</p> <p>CARLO GAVAZZI SPACE SpA</p> |  | <p>N° Doc: <b>PDS-PR-CGS-006</b></p> <p>Doc N°: <b>2</b></p> <p>Ediz.: <b>1</b></p> <p>Issue: <b>10/06/2009</b></p> <p>Pagina <b>117</b> di <b>370</b></p> <p>N° Doc: <b>PDS-RP-CGS-072</b></p> <p>Doc N°: <b>1</b></p> <p>Ediz.: <b>1</b></p> <p>Issue: <b>27/06/2009</b></p> <p>Pagina <b>117</b> di <b>370</b></p> |                |
|---|--|---|----------------|
|   |  | <p>TEST PROCEDURE REFERENCE</p> <p>TEST REPORT REFERENCE</p>  |                |
|   |  | S/N   | FM01           |
| UUT DATA :  | Model  | PFM   | Item           |
| STEP n°   | TEST SEQUENCE  | AMS02 POWER DISTRIBUTION SYSTEM   | C.I.           |
|   |  |   | PDS 18         |
|   |  |   | EXPECTED VALUE |
|   |  |   | MEASURED VALUE |
|   |  |   | REMARKS        |
| BOARD STATUS  |  |   |                |
| OVT Alarm   |  |   |                |
| From O_1 Status: TPD0 to O_8 Status: CAB_N  |  |   |                |
| 3A-3-A-321  | Set ON in All outlets ON/OFF command and push on the relative "W" command  | OK  | OK             |
| 3A-3-A-322  | Click on Read All command in Digital Readout column                        | OK  | OK             |
| Verify the status of the following flags:   |  |   |                |
| 3A-3-A-323  | BOARD STATUS   | OK  | OK             |
| OVT Alarm   |  |   |                |
| From O_1 Status: TPD0 to O_8 Status: CAB_N  |  |   |                |
| 3A-3-A-324  | Set OFF in the window All Outlets ON/OFF and push the relative "W" command | ON  | ON             |
| 3A-3-A-325  | Switch OFF main power bus  | OFF   | OFF            |

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| CARLO GAVAZZI                 |  | AMS02-PDS                                 |     | PDS-PR-CGS-006                               |                                 | PDS-RP-CGS-072  |                          |
|-------------------------------|--|---|-----|--|---------------------------------|---|--------------------------|
| CARLO GAVAZZI SPACE SpA       |  | AMS02-PDS PFM FULL FUNCTIONAL TEST REPORT |     | Data: 10/06/2009<br>Issue: Pagina 118 di 370 |                                 | Data: 27/06/2009<br>Ediz.: 1 Issue: Pagina 118 di 370 |                          |
| UUT DATA :                    |  | Model                                     | PFM | Item   | AMS02 POWER DISTRIBUTION SYSTEM | C.I.  | TEST PROCEDURE REFERENCE |
| STEP n°                       | TEST SEQUENCE  |   |     |  |                                 | S/N   | TEST REPORT REFERENCE    |
|                               |  |   |     |  |                                 | MEASURED VALUE  | REMARKS                  |
| <b>10.3.15.9 PB2-4 SIDE A</b> |  |   |     |  |                                 |   |                          |
| PB2-4-A.1                     | Connect AI 120V and AI 120V RTN power supply signals                                   |   |     |  |                                 | OK  | OK                       |
| PB2-4-A.2                     | Verify that all the cables of the section are connected                                |   |     |  |                                 | OK  | OK                       |
| PB2-4-A.3                     | Launch the PDS controller software   |   |     |  |                                 | Program open  | Program open             |
| PB2-4-A.4                     | Set to "FM" the window Model   |   |     |  |                                 | OK  | OK                       |
| PB2-4-A.5                     | set the CAN BUS board address to 30  |   |     |  |                                 | 30  | 30                       |
| PB2-4-A.6                     | select JMDC = 0  |   |     |  |                                 | 0   | 0                        |
| PB2-4-A.7                     | select TX = A  |   |     |  |                                 | A   | A                        |
| PB2-4-A.8                     | select RX = A  |   |     |  |                                 | A   | A                        |
| PB2-4-A.9                     | Select "CAN BUS I/F Side" to A   |   |     |  |                                 | A   | A                        |
| PB2-4-A.10                    | Select "PDS Side" to A   |   |     |  |                                 | A   | A                        |
| PB2-4-A.11                    | Set input bus voltage to 120V  |   |     |  |                                 | 120V±1V   | 120V                     |
| PB2-4-A.12                    | Set input bus current limitation to 27.5 A   |   |     |  |                                 | 27.5 A±1A   | 27.5 A                   |
| PB2-4-A.13                    | Enable power supply output   |   |     |  |                                 | enabled   | enabled                  |
| PB2-4-A.14                    | Verify that green led of "power switch box" is lighted                                 |   |     |  |                                 | Green led lighted                                     | Green led lighted        |
| PB2-4-A.15                    | Switch ON the "power switch "of "power switch box"                                     |   |     |  |                                 | Switch ON   | Switch ON                |
| PB2-4-A.16                    | Verify that red led of "power switch box" is lighted                                   |   |     |  |                                 | Red led lighted                                       | Red led lighted          |
| PB2-4-A.17                    | Take note of power supply output current   |   |     |  |                                 | 1,1A±0,5A   | 1,1A                     |
| PB2-4-A.18                    | Click on Run flash button  |   |     |  |                                 | OK  | OK                       |
| PB2-4-A.19                    | Set the CAN BUS board address to 31  |   |     |  |                                 | 31  | 31                       |
| PB2-4-A.20                    | Select "CAN BUS I/F Side" to B   |   |     |  |                                 | B   | B                        |
| PB2-4-A.21                    | Click on Run flash button  |   |     |  |                                 | OK  | OK                       |
| PB2-4-A.22                    | Set the CAN BUS board address to 30  |   |     |  |                                 | 31  | 31                       |
| PB2-4-A.23                    | Select "CAN BUS I/F Side" to A   |   |     |  |                                 | A   | A                        |
| PB2-4-A.24                    | Click on PB2-1 button  |   |     |  |                                 | OK  | OK                       |
| PB2-4-A.25                    | Set Digital I/F Test logic value = 1 in "Commanding" column                            |   |     |  |                                 | 1   | 1                        |
| PB2-4-A.26                    | Click on letter "W" on the right of the "1" value                                      |   |     |  |                                 | OK  | OK                       |
| PB2-4-A.27                    | Click on the command READ ALL under the column Digital Readout                         |   |     |  |                                 | OK  | OK                       |
| PB2-4-A.28                    | Verify that in the column Digital Readout under the voice Digital I/F Test appears "1" |   |     |  |                                 | 1   | 1                        |
| PB2-4-A.29                    | Set Digital I/F Test logic value = 0 in "Commanding" column                            |   |     |  |                                 | 0   | 0                        |
| PB2-4-A.30                    | Click on letter "W" on the right of the "0" value                                      |   |     |  |                                 | OK  | OK                       |
| PB2-4-A.31                    | Click on the command READ ALL under the column Digital Readout                         |   |     |  |                                 | OK  | OK                       |
| PB2-4-A.32                    | Verify that in the column Digital Readout under the voice Digital I/F Test appears "0" |   |     |  |                                 | 0   | 0                        |
| PB2-4-A.33                    | Verify the status of the following flags:<br>BOARD STATUS                              |   |     |  |                                 | OK  | OK                       |
| DATE: 15.06.09                | TEST CONDUCTOR   | QA  |     |  |                                 |   | CUSTOMER                 |

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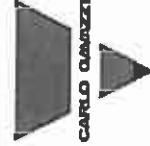
| CARLO GAVAZZI           |   | AMS02-PDS                                 |        | N° Doc:<br>Doc N°:<br>Ediz.:<br>Issue:<br>Pagina<br>Page | PDS-PR-CGS-006<br>Data:<br>Date:<br>10/06/2009<br>di<br>370<br>of | N° Doc:<br>Doc N°:<br>Ediz.:<br>Issue:<br>Pagina<br>Page | PDS-RP-CGS-072<br>Data:<br>Date:<br>27/06/2009<br>di<br>370<br>of |
|-------------------------|---|---|--------|--|---|--|---|
| CARLO GAVAZZI SPACE SpA |   | AMS02-PDS PFM FULL FUNCTIONAL TEST REPORT |        | TEST PROCEDURE REFERENCE                                 |   | TEST REPORT REFERENCE                                    |   |
| UUT DATA :              | Model   | PFM                                       | Item   | AMS02 POWER DISTRIBUTION SYSTEM                          | C.I.  | S/N  | FM01  |
| STEP n°                 | TEST SEQUENCE   |   |        |  | EXPECTED<br>VALUE   | MEASURED<br>VALUE  | REMARKS   |
|                         | OVT ALARM   |   |        |  | OK  | OK   | OK  |
|                         | Input OVC Alarm   |   |        |  | OK  | OK   | OK  |
|                         | DCDC ON/OFF   |   |        |  | ON  | ON   | ON  |
|                         | 27V UV  |   |        |  | OK  | OK   | OK  |
|                         | 29V Trip  |   |        |  | OK  | OK   | OK  |
|                         | DCDC OFF/ON CMD   |   |        |  | ON  | ON   | ON  |
| PB2-4-A.34              | Measure with multimeter the voltage on ESEM 3A-4 out 1 (Check that load is not connected) |   |        |  | 28,00V±1,00V  | 28,17V   | V1  |
| PB2-4-A.35              | Verify the value of the following telemetry:  |   |        |  | V1±1,092V   | 28,09V   | Click on relative Rbutton<br>Power cell OFF                       |
| PB2-4-A.36              | Set OFF on DCDC ON /OFF command window and send the command                               |   |        |  | OK  | OK   |   |
| PB2-4-A.37              | Click on the command READ ALL under the column Digital Readout                            |   |        |  | OK  | OK   |   |
|                         | Verify the status of the following flags:   |   |        |  | OK  | OK   | OK  |
|                         | BOARD STATUS  |   |        |  | OK  | OK   | OK  |
|                         | OVT ALARM   |   |        |  | OK  | OK   | OK  |
|                         | Input OVC Alarm   |   |        |  | OK  | OK   | OK  |
|                         | DCDC ON/OFF   |   |        |  | OFF   | OFF  | OFF   |
|                         | 27V UNV   |   |        |  | OK  | OK   | OK  |
|                         | 29V Trip  |   |        |  | OK  | OK   | OK  |
|                         | DCDC OFF/ON CMD   |   |        |  | OFF   | OFF  | OFF   |
| PB2-4-A.39              | Click on the command READ ALL under the column Analog Readout                             |   |        |  | OK  | OK   | OK  |
|                         | Verify the value of the following telemetries:  |   |        |  | -40°C< T<80°C   | 35,90°C  |   |
| PB2-4-A.40              | Temperature   |   |        |  | 2,000mV±150mV   | 2,020mV  |   |
| PB2-4-A.41              | Analog Ref. 2.0V  |   |        |  | 0,00V±1,092V  | -0,062V  |   |
| PB2-4-A.42              | Verify the following analog monitor:  |   |        |  | 0,00V±0,10V   | 0,007V   |   |
| PB2-4-A.43              | Output Voltage  |   |        |  | 31  | 31   |   |
| PB2-4-A.43              | Measure with multimeter the voltage on ESEM 3A-4 out 1 (Check that load is not connected) |   |        |  | B   | B  |   |
| PB2-4-A.44              | Set the CAN BUS board address to 31   |   |        |  | OK  | OK   |   |
| PB2-4-A.44              | Select "CAN BUS I/F Side" to B  |   |        |  | OK  | OK   |   |
| PB2-4-A.45              | Click on the command READ ALL under the column Digital Readout                            |   |        |  | OK  | OK   |   |
|                         | Verify the status of the following flags:   |   |        |  | OK  | OK   | OK  |
|                         | BOARD STATUS  |   |        |  | OK  | OK   | OK  |
|                         | OVT ALARM   |   |        |  | OK  | OK   | OK  |
|                         | Input OVC Alarm   |   |        |  | OK  | OK   | OK  |
|                         | DCDC ON/OFF   |   |        |  | OFF   | OFF  | OFF   |
|                         | 27V UNV   |   |        |  | OK  | OK   | OK  |
|                         | 29V Trip  |   |        |  | OFF   | OFF  | OFF   |
|                         | DCDC OFF/ON CMD   |   |        |  | OK  | OK   | OK  |
| DATE: 15.06.09          | TEST CONDUCTOR  | QA  | 972010 | CUSTOMER   |   |  |   |

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| CARLO GAVAZZI           |   | <b>AMS02-PDS</b>                          |                                      | N° Doc: PDS-RP-CGS-072<br>Doc N°: PDS-PR-CGS-006 |  |
|-------------------------|---|---|--------------------------------------|--|--|
| CARLO GAVAZZI SPACE SpA |   | AMS02-POS PFM FULL FUNCTIONAL TEST REPORT |                                      | Ediz.: 2   | Data: 10/06/2009<br>Date: 27/06/2009   |
| UUT DATA :              |   | Model PFM                                 | Item AMS02 POWER DISTRIBUTION SYSTEM | Issue: Pagina 120 di 370                         | Issue: Pagina 120 di 370<br>Page of    |
| STEP n°                 |   | TEST SEQUENCE                             |                                      | TEST PROCEDURE REFERENCE                         |  |
| S/N                     | FM01  | C.I.                                      | PDS 18                               | S/N  | FM01                                   |
| PB2-4-A.47              | Set ON on DCDC OFF/ON command window and send the command   |   |                                      | EXPECTED VALUE                                   | MEASURED VALUE                         |
| PB2-4-A.48              | Click on the command <b>READ ALL</b> under the column Digital Readout                                 |   |                                      | OK   | OK                                     |
|                         | Verify the status of the following flags:   |   |                                      | OK   | OK                                     |
| PB2-4-A.49              | BOARD STATUS<br>OVT ALARM<br>Input OVC Alarm<br>DCDC ON/OFF<br>27V UNV<br>29V Trip<br>DCDC OFF/ON CMD |   |                                      | OK<br>OK<br>OK<br>ON<br>OK<br>OK<br>ON           | OK<br>OK<br>OK<br>ON<br>OK<br>OK<br>ON |
| PB2-4-A.50              | Set the CAN BUS board address to 30   |   |                                      | ON   | ON                                     |
| PB2-4-A.51              | Select "CAN BUS I/F Side" to A  |   |                                      | 30   | 30                                     |
| PB2-4-A.52              | Click on the command <b>READ ALL</b> under the column Digital Readout                                 |   |                                      | A  | A                                      |
|                         | Verify the status of the following flags:   |   |                                      | OK   | OK                                     |
| PB2-4-A.53              | BOARD STATUS<br>OVT ALARM<br>Input OVC Alarm<br>DCDC ON/OFF<br>27V UNV<br>29V Trip<br>DCDC OFF/ON CMD |   |                                      | OK<br>OK<br>OK<br>ON<br>OK<br>OK<br>ON           | OK<br>OK<br>OK<br>ON<br>OK<br>OK<br>ON |

DATE: 15.06.04 TEST CONDUCTOR *Giovanni* QA *Giovanni*

Customer *Giovanni*

|  <p><b>CARLO GAVAZZI</b></p> |  | <h1 style="text-align: center;"><b>AMS02-PDS</b></h1>  |                             |
|---|--|--|-----------------------------|
| <b>AMS02-PDS PFM FULL FUNCTIONAL TEST REPORT</b>  |  | N° Doc:<br>Doc N°: <b>PDS-PR-CGS-006</b><br>Ediz.: <b>2</b> Data: <b>10/06/2009</b><br>Issue:<br>Pagina <b>121</b> di <b>370</b><br>Page |                             |
| <b>AMS02 POWER DISTRIBUTION SYSTEM</b>  |  | Ediz.: <b>1</b> Issue:<br>Pagina <b>121</b> di <b>370</b><br>Page  |                             |
| UUT DATA :  | Model  | Item   | TEST PROCEDURE REFERENCE    |
| STEP n°   | TEST SEQUENCE  | C.I.   | S/N<br>FM01                 |
| STEP n°   | TEST SEQUENCE  | EXPECTED VALUE   | MEASURED VALUE              |
| TEST CONDUCTOR  | QA   | TEST REPORT REFERENCE  |                             |
| <b>10.3.1.5.10 ESEM 3A-4 SIDE A</b>   |  |  |                             |
| 3A-4-A.1  | Click on ESEM 3A-4 button  | OK   | OK                          |
| 3A-4-A.2  | Connect to active loads outlet 1, 2, 3, 4, 5, 6, 7 and 8.                              | OK   | OK                          |
| 3A-4-A.3  | Verify that loads are set to 0A current absorption                                     | OK   | OK                          |
| 3A-4-A.4  | Set Digital I/F Test logic value = 1 in "Commanding" column                            | 1  | 1                           |
| 3A-4-A.5  | Click on letter "W" on the right of the "1" value                                      | OK   | OK                          |
| 3A-4-A.6  | Click on the command READ ALL under the column Digital Readout                         | OK   | OK                          |
| 3A-4-A.7  | Verify that in the column Digital Readout under the voice Digital I/F Test appears "1" | 1  | 1                           |
| 3A-4-A.8  | Set Digital I/F Test logic value = 0 in "Commanding" column                            | 0  | 0                           |
| 3A-4-A.9  | Click on letter "W" on the right of the "0" value                                      | OK   | OK                          |
| 3A-4-A.10   | Click on the command READ ALL under the column Digital Readout                         | OK   | OK                          |
| 3A-4-A.11   | Verify that in the column Digital Readout under the voice Digital I/F Test appears "0" | 0  | 0                           |
| Verify the status of the following flags:   |  |  |                             |
| BOARD STATUS  |  |  |                             |
| OVT Alarm   | OK   | OK   | OK                          |
| O_1 CMD: JPD_R  | ON   | ON   | ON                          |
| O_2 CMD: ER1_R  | OFF  | OFF  | OFF                         |
| O_3 CMD: SPD1_R   | OFF  | OFF  | OFF                         |
| O_4 CMD: ERO_R  | OFF  | OFF  | OFF                         |
| O_5 CMD: UPDO   | OFF  | OFF  | OFF                         |
| O_6 CMD: SPD0_N   | OFF  | OFF  | OFF                         |
| O_7 CMD: TPPD5  | OFF  | OFF  | OFF                         |
| O_8 CMD: TPPD_N   | ON   | ON   | ON                          |
| 3A-4-A.12   |  |  |                             |
| O_1 Status: JPD_R   | OFF  | OFF  | OFF                         |
| O_2 Status: ER1_R   | OFF  | OFF  | OFF                         |
| O_3 Status: SPD1_R  | OFF  | OFF  | OFF                         |
| O_4 Status: ERO_R   | OFF  | OFF  | OFF                         |
| O_5 Status: UPDO  | OFF  | OFF  | OFF                         |
| O_6 Status: SPD0_N  | OFF  | OFF  | OFF                         |
| O_7 Status: TPPD_N  | OFF  | OFF  | OFF                         |
| O_8 Status: TPPD_N  | OK   | OK   | OK                          |
| 3A-4-A.13   | Push on Read All button in Analog Readout column                                       |  |                             |
| Verify the current telemetries:   |  |  |                             |
| 3A-4-A.14   | O_1 Current: JPD_R<br>O_2 Current: ER1_R<br>O_3 Current: SPD1_R                        | 0,000A±0,225A<br>0,000A±0,225A<br>0,000A±0,225A  | 0,041A<br>-0,010A<br>0,038A |
| DATE: 15.06.09  | TEST CONDUCTOR <i>GG 2013</i>  | QA <i>✓</i>  | CUSTOMER <i>✓</i>           |

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